CHEMICAL MARKETS

VOL. XXV. JULY, 1929 No. 1.

Tricks of the Trade

ONLY four short years ago a certain imported dye was selling in our domestic markets at 35 cents a pound, duty paid while the best cost of the largest American manufacturer was well over one dollar a pound. If we might make a million pounds—so the operating chief reported—we might then be able to bring the cost down to within the neighborhood of half a dollar, which was obviously impractical and not extremely helpful. As both the American and foreign processes were substantially the same, and employed the same raw materials, it seemed clearly either a chemical miracle or a plain case of dumping. Within the past six weeks the same American production department has gleefully recorded a cost for the identical dye made by the same old process of twenty cents a pound.

THIS is no industrial fable related for the sake of its pretty moral. The whole story was told quite recently to a small group of chemical men at lunch by the American company's president, and there is moreover, no chemical manufacturer of any considerable experience who cannot remember equally astonishing results of the "know how" in chemical production. It was no epoch-making discovery that clipped four-fifths off the cost of that dye—a change in time here, closer temperature control there, a new bit of apparatus somewhere else, all aided no doubt by a little saving in labor and a lower cost of some of the materials all combined to work the seeming miracle.

THESE little tricks of the trade have great effects upon the chemical industry. Seldom do they get into even casual, friendly chemical conversation: they never appear in our technical literature. They are scrupulously omitted from all patent specifications. They are, however, most dearly cherished secrets, since they give their fortunate possessor a fundamental advantage over each of his competitors. Thus, they foster that secretive spirit which appears to outsiders so unpleasant and unprogressive a characteristic of the chemical industry. At the same time they inject variations in production costs which color chemical selling problems blue and chemical balance sheets red. These kinks of "know how" are an element inherent in chemical manufacturing; and if they cannot be eliminated, we must be prepared always to reckon with their results.

"See American First"

SOUND business and production reasons dictate the choice of alcohol whose quality is high . . . and dependably so from year to year. "American" offers you this satisfactory alcohol.

Your business is invited with confidence. For "American" producing plants and distributing warehouse system are on a basis which enables us to meet exacting requirements. And contributing to "American" quality is an exclusive distillation process, originated in our plant.

A survey of your alcohol needs with relation to the quality of "American" Alcohol will indicate that it pays to "See American First."

This is number 7 of a series depicting historical periods in the development of America

A CENTURY ago the incredibly rich resources of America waited only upon transportation for development. Then commenced the era of railway building which opened up empires of trade. The first American railroad, the Baltimore and Ohio, was fifteen miles long. Trains ran in 1830. Extension of the line was threatened by a contest with a canal over right of way. In fact, railways then were generally considered of secondary importance to canals. The swift growth of the United States has vindicated the judgment of the early advocates of steam over mule-power

"SEE AMERICAN FIRST"

COMMERCIAL ALCOHOL CORPORATION

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Overworking Science

It is distinctly disconcerting for the rest of the country to discover Chicago clinging to old-fashioned ideas. Back in the gay nineties, having reached the peak of success in World's Fairs, the citizens of the Illinois metropolis fondly cherish the idea of repeating that triumph in 1933. We can all admire the brave spirit that refuses to admit that Chicago cannot do easily what St. Louis and Buffalo did only with difficulty and what Philadelphia failed miserably to do at all. But our admiration of this civic virture, turns to suspicion either of a municipal pride that is blind to plain facts or a greedy hospitality that counts any visitor's hotel bill a clear profit. For the whole idea of the World's Fair—in Chicago or Greens Corners—is outworn.

The *raison d'etre* of these expositions has been destroyed. It would be apparently useless to review all the progress in popular education and all the new forms of amusement that have weaned Americans away from the World's Fair, since Chicago refuses bluntly to profit by the more recent experience of other American cities, and even despite cross purposes and dissentions among her own citizens, has resolved to go ahead.

This concerns the chemical industry, for it is planned to harness chemistry to this obsolete enterprise. This willing worker is to be put on show as a major attraction, and already some of the leaders of the industry have been sounded out on the subject of making exhibits. We can think of other, better ways of promotion; whether we are trying to sell more chemicals, or to impress the man on the street with the basic importance of chemistry in modern life.

The I. G. Balance Sheet

German financial papers have been outspoken in their adverse criticism of the I-G's recent financial policy, reflecting in all probability the natural disappointment of the stockholders when increased profits did not bring an increase in the 12 per cent dividend rate which was established in 1927. On the business of last year 71,778,528 marks ($14, 355,705) were written off for depreciation; 6,600,000 marks ($1,320,000) were set aside for the new fund for the relief of pensioned employees; 11,708,644 marks ($2,341,729) were put into reserves which are now brought up to the tidy total of $40,000,000. The net profit for the year was 118,458,169 marks ($23,691,634) against 100,812,133 marks ($20, 162,425) for 1927. The balance carried forward is $1,092,355.

Comments on this balance sheet in the German press range from discreet inquiries as to the necessity for building up so large a liquid reserve to forthright denunciation of the silence maintained by the directors and management as to the aims and objects of a financial plan which is obviously ultraconservative in this respect or else contemplates good use for a great sum.

A very similar curiosity of quite different origin doubtless exists among many chemical people outside of Germany.

A Land-Laboratory Merger

If there is one subject which, more than any other, has held the center of the chemical stage during the past few years, it is nitrogen. Not since the hysterical days of the war have so many gallons of editorial ink been devoted to any one topic. The economic problem involved in its future presents interesting and, from the industry's point of view, serious aspects. Loud cries of overproduction have recently been raised and many have wondered where it was all going to end.

Now, as a fitting climax comes the unexpected announcement of a working agreement between the I. G., as producers of synthetic nitrogen, and the Chilean Government, as representative of producers of natural nitrates. Upon the conclusion of these fascinating negotiations, it was announced that nitrate prices would be reduced six per cent for the coming season, and immediately following, the new price schedule on nitrate of soda was released in this country with quotations at $2.10 per 100 pounds, carload lots. It was also announced that the price relationship between Chilean and synthetic nitrogen would remain at this fixed ratio of differential and that common selling will be started soon.

It is obvious that this announcement changes the world picture on nitrogen. The article elsewhere in these pages and the one in our issue of last month give comprehensive surveys of the situation to date but this new merger of natural and synthetic interests puts an entirely different aspect upon the nitrogen situation of the world. Plainly it follows the modern industrial trend towards consolidation for increased market stability and lowered costs, in this case obviously in the sales department.

Quotation Marks

The chemistry of to-day remains almost wholly the product of British and German research, while the chemical trade of the world is dominated by two firms —one British and the other German. These two—Imperial Chemical Industries and the I. G. Farbenindustrie—might almost be called the nationalized chemical industries of their respective countries; beside them a representative American firm such as the Du Pont de Nemours & Co., despite its growth last year, is a mere pigmy.—*Manchester Guardian Commercial.*

The United States has set its face definitely toward the goal of business individualism, supplemented by associated and co-operative effort which, in turn, is supplemented by governmental assistance. We favor industrial self-regulation, except where monopoly perils are so apparent or public interests so large, that unrestricted private control is not feasible. We believe that business, acting on its own initiative and guided by the standards it makes for itself, should be free of bureaucratic interference.—*Dr. Julius Klein.*

It is the nature of science to progress and nearly all of her greatest advances at first have an air of heresy about them. Those apparent heresies which are really founded on truth endure and become scientific monuments; those which are based on error are overthrown and forgotten. Soon no trace remains to remind the world that the conservatives are sometimes right.—*Journal of Chemical Education.*

If there is any principle of the Constitution that more imperatively calls for attachment than any other, it is the principle of free thought, not free thought for those who agree with us, but freedom for the thought that we hate.—*Justice Oliver Wendell Holmes.*

The tendency of the age is to give human credit in chief part to those who have forged to the front in industry and in finance. Nevertheless, there seems to me to be, beneath the surface, a small yet vigorous and growing trend toward higher purposes.—*Franklin D. Roosevelt.*

To advocate the killing of a human being as a part of a program of law enforcement is as bad as to advocate mob law.—*Representative William A. Pittenger of Minnesota.*

Country life does not always have breadth, but it has depth.—*Calvin Coolidge.*

America is prosperous. There are many factors responsible for our great prosperity, but I shall mention the three which I believe are the most important; the efficient low-priced motor-car, the high value we place on labor, and our ability to raise enormous sums of money for industrial development.—*W. C. Durant.*

In industry technically trained workers can only fulfill their purpose so long as they become business-minded with a tolerant and sympathetic outlook on industrial leadership and a willingness to work in harmony with it.—*G. J. Callister.*

Biography is a very definite region bounded on the north by history, on the south by fiction, on the east by obituary and on the west by tedium.—*Philip Guedalla.*

Legal education is one of the few branches of education that can be made to pay and still be kept respectable.—*President Robert M. Hutchins of Chicago University.*

Our governments do not protect us against war.—*Alanson B. Houghton.*

This is a gasoline civilization here in America.—*Ray Lyman Wilbur.*

Ten Years Ago

From our issues of July, 1919

Union Dye & Chemical Co., which took over the assets and plant of the Federal Dyestuff & Chemical Co. at Kingsport, Tenn., when the latter went into receivers' hands, shut down production.

American Aniline Products, Inc., New York, was the successful bidder for 6,018 shares of capital stock of the Roessler & Hasslacher Chemical Co., with a bid of $505 per share at public auction by the Alien Property Custodian.

L. C. Gillespie & Sons was incorporated in New York with capital of $2,000,000 to carry on business in shellac.

Orlando F. Weber, president, National Aniline & Chemical Co., Inc., appointed Robert T. Baldwin, assistant to the president.

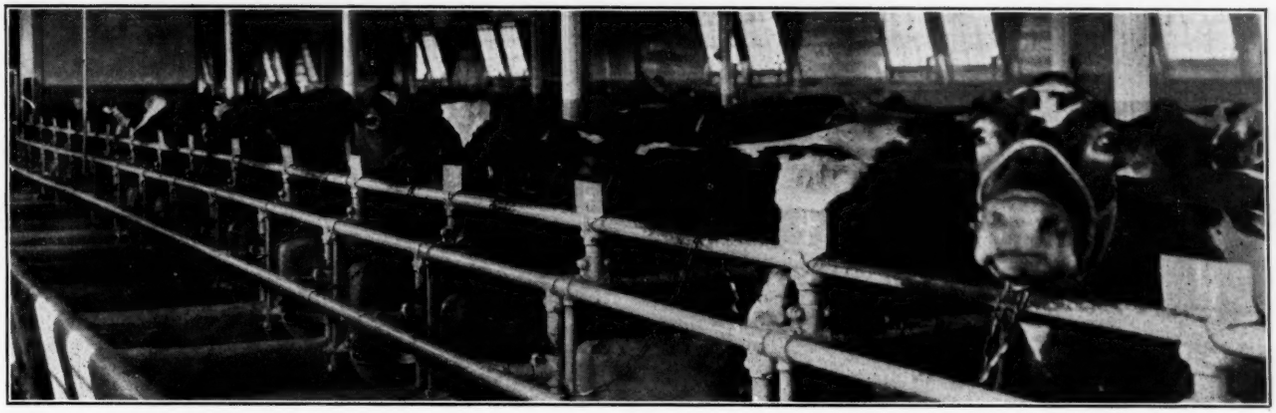
Sir John T. Brunner, of Brunner, Mond & Co., Ltd., British alkali manufacturers, died July 1, at Chartsey, England.

Newport Co. was incorporated in Delaware with capital of $5,000,000 to manufacture dyestuffs and chemicals

Pacific R. & H. Chemical Co. was incorporated in Los Angeles with a capital stock of $100,000.

National Aniline & Chemical Co., Inc., reports net income for 1918 of $4,220,848.

W. D. Huntington, Davison Chemical Co., was unanimously re-elected president of the National Fertilizers' Association.



(Courtesy Borden Farm Products Co.)

The DAIRY COW *as a Chemical Factory*

By L. A. Rogers

In Charge, Dairy Research Laboratories, U. S. Department of Agriculture

THE value of milk for food purposes is so great that ordinarily its constituents can be used for manufacturing purposes only as they occur as by-products resulting from the manufacture of butter or cheese. Milk fat is sometimes separated in a pure form and used in confectionery and baking but this merely takes the place of an equivalent volume of butter.

The average composition of milk as produced in this country is 3.66 per cent. fat, 2.95 per cent. casein, 0.52 per cent. albumin, 4.91 per cent lactose, 0.69 per cent. ash, and a number of minor constituents present in very small amounts. Of the 120,000,000,000 pounds of milk produced annually in the United States, 36 per cent. is used in the manufacture of butter. Since in butter making only the fat and a very small amount of the other solids are used there are left 22,000,000,000 pounds of skim milk and 1,300,000,000 pounds of buttermilk. About 3½ per cent. of the milk produced is used in cheese making from which 4,300,000,000 pounds of whey are obtained. In the manufacture of condensed and evaporated milk no by-products occur, but additional skimmed milk results from the separation of fat in the form of cream for direct consumption and ice-cream making.

These 28,000,000,000 pounds of dairy by-products contain 2,500,000,000 pounds of dry matter of which about 900,000,000 pounds are protein and 1,400,000,000 pounds are sugar (lactose).

About 85 per cent. of the protein is casein, a phospho-protein peculiar to milk in which it exists in a colloidal condition. It is easily separated from the milk by precipitation with acid or rennin and on account of its physical properties can be utilized in a great variety of ways. When the casein is removed from milk by precipitation with acid or rennin there remains in solution in the whey a small amount of protein which is largely lactalbumin with a small amount of lactoglobulin. Lactalbumin is very similar to blood albumin and egg albumin. The carbohydrate of milk is the disaccharide, lactose, which occurs only in the milk of mammals. It is much less soluble and less sweet than cane sugar. On hydrolysis it yields glucose and galactose. The salts of milk, while highly important from a nutritional standpoint, have no significance as raw material. At the present time the by-products as well as the major products of milk are used almost entirely for food purposes although the greater part of the by-products finds its way into the human dietary by the devious and inefficient route of feeding to farm animals. Skimmed milk contains all the solids not fat of the whole milk in slightly increased percentages, buttermilk has a composition nearly identical with skimmed milk except that some of the sugar has been converted into acid. Both contain traces of fat and when they are dried this becomes an appreciable amount. Whey from cheese or casein contains about seven per cent. of solids of which nearly five per cent. is lactose and 0.9 per cent. protein, largely lactalbumin. The whey

from cheese making contains also varying amounts of fat but in well managed factories this is removed by centrifugal separators and used for butter making.

While by far the greater part of these by-products is fed to farm animals, a very considerable quantity of products is manufactured from them. Condensed skimmed milk, both sweetened and unsweetened, is used extensively by bakers, confectioners, and ice cream makers. Nearly all the buttermilk consumed in the cities is now made from skimmed milk. Cottage cheese and other simple cheeses furnish a profitable means of disposing of skimmed milk when a market is available. The perfection of efficient equipment has given a stimulus to the making of dried skimmed milk. In 1926 about 90,000,000 pounds of this product were made in the United States. Dried skimmed milk is used in sausages and ice cream but its principal use is in baking. Not only does it add materially to the food value of any product in which it is used but its physical properties have a favorable effect on the appearance and texture. In bread making dried skimmed milk increases the water holding properties of the dough and improves the crust, color, and crumb. The increased yield due to the added milk solids and greater moisture content may be enough to offset the cost of the dried milk. Skimmed milk is also preserved for feeding purposes by developing a high acidity with special cultures of bacteria and concentrating under vacuum to a pasty consistency. This product has also a place in cookery requiring an acid product. Buttermilk is prepared in the same way and is used extensively as a poultry feed.

Importance of Casein

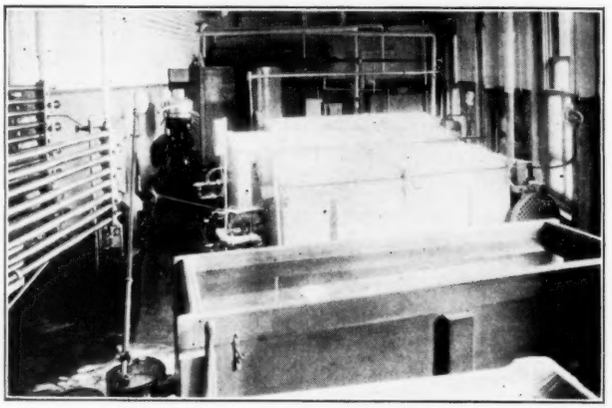
The one constituent of milk which has found an extensive application in industry in casein. Dissolved in a solution of borax, ammonia, or a combination of the two with trisodium phosphate and mixed with china clay or satin white, it makes possible a high finish on paper. Other adhesives have been almost entirely displaced for this purpose. Mixed with hydrated lime, sodium carbonate, and other alkalis it makes a glue especially resistant to water and to high temperature. In the late war the value of this glue in airplane construction was so thoroughly demonstrated that its use has been much extended. Casein glue is especially valuable in pianos and furniture for use in the tropics, and in automobile bodies where a moisture resistant glue is required. It is also useful for pasting labels on cans and bottles which are to be held on ice or in cold water.

When casein is exposed simultaneously to pressure and heat and subsequently hardened with formaldehyde a plastic substance is produced which has a great variety of uses. It can be molded into simple designs, or made into sheets, rods, tubes, or bars. It can be beautifully colored and highly polished. It is odorless and non-inflammable and can be drilled, sawed, and turned on a lathe. The manufacture of casein plastics was formerly confined to Germany; but four or five factories now make them in this country, and buttons, combs, cigar and cigarette holders, cuff links, dominoes, dice, electrical insulation and switch plates, handles, manicure and toilet sets, pen holders, fountain pen barrels, pencils, pipe stems, radio parts, and spectacle frames made from material coming from skimmed milk are now common. Mixed with hydrated lime or other alkalis, pigment, filler, and cold water, casein makes a paint suitable for canvas, wood, stone, cement, masonry, and metals. It dries rapidly, can be applied in unfavorable weather and withstands rain and weathering very well.

In the textile industry casein is used to fix the color in printing calico and in a combination of powdered mica to give a metallic lustre. Applied to the surface of light leathers such as sheepskin it gives a gloss to the surface. Added to liquid fungicides and insecticides it causes them to spread evenly over the leaves of the plant and to adhere when they dry. In the form of caseinates of the alkali metals it is a constituent of many medicinal foods. It is also used as a vehicle for the administration of lithium, mercury, arsenic, iron, silver, and iodine.

Lactalbumin's Possibilities

Lactalbumin might have many possibilities if it could be separated in its natural condition. In addition to its nutritive qualities, which are very high, it has the physical properties of blood albumin and egg albumin. Unfortunately no method has yet been devised by which lactalbumin can be separated without altering to some extent the characteristics which would make it of value in confectionery, baking, dyeing, and adhesives. It is separated in an impure state as a by-product of lactose manufacture but it is so denatured by the heat precipitation that it has no value except as a poultry feed.



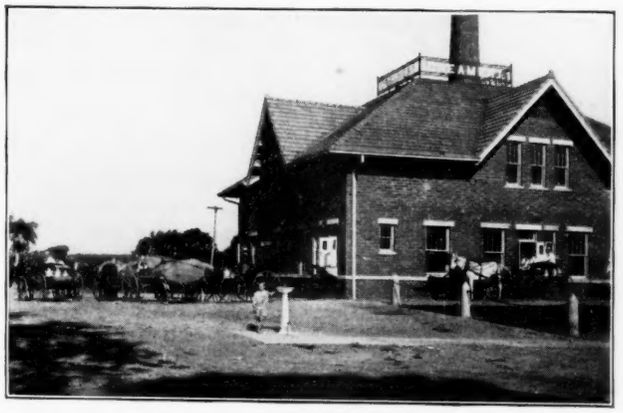
By-products room of a modern dairy plant showing cream separator at left. In this room surplus milk is converted into various by-products such as casein, lactalbumin, and lactose.

Although milk sugar, or lactose, makes up nearly one half of the solids of milk and probably has unique dietary importance, it has only limited commercial uses. It is used quite extensively in modifying cow's milk for infant feeding and as a vehicle in preparing

medicines in tablet form. It is used in some liquors on account of the frosty appearance produced by crystallization on the inside of the bottle. Because of its therapeutic value the use of lactose in place of cane sugar for direct consumption is apparently increasing. However an annual production of about 4,000,000 pounds supplies the demands of the country for all purposes.

Forms and Uses of Lactose

Three forms of lactose have been isolated and a fourth is believed by some to exist. The alpha hydrate, the ordinary lactose of commerce, has a low solubility and consequently little sweetness. These properties have restricted its use to a limited field. The beta anhydride is much more soluble and has about one-fourth of the sweetness of cane sugar. It would no doubt be possible to extend the use of lactose for direct consumption if it could be supplied in this form at a reasonable price. Since in hot solution it promptly reverts to a mixture of alpha and beta lactose the beta form would have no especial application in confectionery or cooking. Numerous acids and other fermentation and oxidation products may be obtained from lactose but none are known which cannot be produced equally well from cheaper sugars. Under present conditions the cost at the factory of refined lactose is more than twice the retail price of cane sugar. Refined lactose must be made on a relatively small scale since the nature of the raw material precludes its concentration in large quantities at one point. It is probably possible to improve



A co-operative creamery. It would be possible to obtain at a factory of this type about 20,000 pounds of skimmed milk and 2,000 pounds of buttermilk daily.

the making process so that the cost will be reduced somewhat but any increased consumption must depend not so much on lower prices as on the development of new uses for which no other material is so satisfactory. If such uses are found they will probably be based on the properties which makes lactose unsatisfactory for most purposes.

The development of the manufacture of dairy by-products of any kind is retarded by the fact that there is rarely a large supply of raw material at any one place. Although about 70 per cent. of the butter is now made in factories and many of these have a large output, it is the exception for a large creamery to receive more milk than the small amount necessary for making the cultures for cream ripening. The milk is usually separated on the farm and the cream taken or shipped by rail to the creamery. On the other hand cheese factories must have fresh milk and are limited in their capacity by the milk production of a relatively small area. Very few cheese factories receive as much as 50,000 pounds of milk daily. The 4,300,000,000 pounds of whey from cheese making are in relatively small factories, scattered over a large area.

The geographical distribution of this raw material is an important factor in developing its uses for manufacturing purposes. About 70 per cent. of the cheese produced in the United States is made in Wisconsin, with New York, at one time the leading cheese section of the country, a poor second with only 11 per cent. Over 40 per cent. of the butter is made in Iowa, Wisconsin, and Minnesota. The constantly increasing demand for milk and cream for the cities is pushing the butter and cheese territory farther and farther from the Atlantic seaboard. Butter making and cheese making are developing on the Pacific Coast and in the intermountain states, and cheese is now made in Mississippi and Texas. There is also a seasonal variation in milk production in the manufacture of dairy products which must be considered. Three times as much cheese is made in June as in January, and a milk sugar factory equipped to handle the peak load in June would be running at one third capacity in January. The variation in butter is not so great, but the June production is twice as large as that for January.

Competition as Stock Feed

It is obvious that any product made from skimmed milk or whey must compete for the raw material with the calves, pigs, and poultry on the farms. A certain amount of milk is essential for very young animals, but if there is a more remunerative market for skimmed milk than feeding it on the farm it is always possible to substitute other feeds at an early age. In sections where the price of market milk is high farmers sometimes sell all their milk and buy dried skimmed milk produced where milk is cheap for calf feeding. The actual value of skimmed milk for feeding is problematical. In calculating rations it is customary to estimate the value of 100 pounds of skimmed milk as equal to one half bushel of corn. Thus with corn at 80 cents per bushel the farm value of skimmed milk would be 40 cents per hundred. However the returns for skimmed milk for manufacturing purposes are more prompt and more certain than for feeding, and in most sections a price of forty to fifty cents per hundred will bring it to the creamery.

On the Pacific Coast where production costs are lower than the average, large quantities of skimmed

milk are available at prices ten or fifteen cents lower than those given above. It will be seen that a product like casein yielding only a little more than three pounds per hundred and selling at 14 or 15 cents per pound can be made only where milk is produced at a very low price or where, through seasonal variations in the demand for whole milk, there is a surplus which must be disposed of with as little loss as possible.

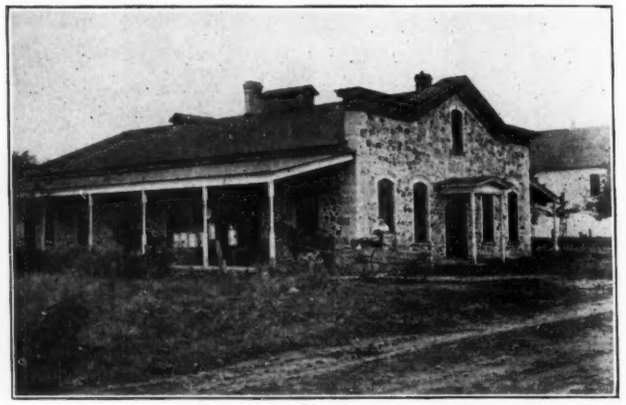
Economics of Casein Making

Casein is rarely a very profitable outlet for skimmed milk but has the advantage of requiring for its manufacture only inexpensive equipment and no especial marketing problem. When it is made on a large scale the whey may be utilized for making lactose, and in some cases albumin cheese of the Ricotta type.

The methods of making casein are usually crude and the cost could undoubtedly be reduced by the development of labor saving devices.

The buttermilk contains sufficient casein to supply all the demands of the country and has a very low value, but on account of its high fat and mineral content and possibly some denaturization of the protein buttermilk casein is not satisfactory for most purposes.

Any industrial product made from skimmed milk must also compete for raw material with various products used for human or animal food. From 100 pounds of skimmed milk may be made 15 pounds of cottage cheese at four cents per pound, 33 pounds of



A Wisconsin cheese factory of the type which could supply about 3,000,000 pounds of whey annually.

concentrated sour skimmed milk at three cents per pound, or nine pounds of dried skimmed milk at nine or ten cents per pound. The cost of making dried skimmed milk by an efficient process is no greater than the cost of making casein but the gross return per hundred weight of skimmed milk is more than twice as great. On the other hand a comparatively large investment is required for a plant manufacturing dried skimmed milk and it can be operated efficiently only with a large supply of milk.

Whey is not highly regarded for feeding and could probably be secured for manufacturing purposes at almost any cheese factory for 10 to 15 cents per hundred pounds. In some cheese districts where factories are numerous and roads are good it would be possible to concentrate large quantities of whey at one point by tank trucks.

The development of new uses for some of these products is of real importance not only to the chemical industry in which they may find a place, but especially to the dairy industry. Over 35 per cent. of the milk produced in this country is sold for the fat alone, and the price of a large part of the remainder is based on the fat content. In other words, the commercial value of the milk is largely in one third of the solids which it contains while the other two thirds has only a limited market value.

A greater use of such constituents as casein, albumin, and milk sugar would increase the returns to the farmer who now produces milk on a very close margin and thus make it possible to sell the fat with profit at a lower price.

Germany's Progress in Making Nitric Acid by Ammonia Oxidation

I. G. Farbenindustrie A. G. and the cyanamide works at Piesteritz and Trostberg in Bavaria dominate German development in producing nitric acid by oxidization of ammonia. Both activated iron oxide and platinum, respectively, are used as catalysts. The chief interest of the German dye trust in producing nitric acid by ammonia oxidization lies in its subsequent manufacture of fertilizer calcium nitrate. This is manufactured at Oppau and Merseburg. Germany's production of nitric acid, exclusive of that made by the dye trust for calcium nitrate manufacture, is estimated at about 85,000 metric tons, according to the Department of Commerce.

Another factor which may enter this field of production soon is the recently founded Ruhrchemie A. G., of Essen, with a casale ammonia synthesis plant under construction. This organization intends to exploit an allegedly cheaper hydrogen from waste coke oven gases supplied by Ruhr plants.

Official German export statistics group the salts of phosphoric acid under one class, of which the bulk is probably the disodium and the ammonium phosphates. The total foreign trade in 1928 rose to 46,500 metric tons as compared to 15,760 tons in 1927, reports the Department of Commerce. This tremendous growth in German phosphorous compound trade adds strength to the estimates of German phosphorous production as reported by Dr. Johannes Hess, Munich, December 8, 1928, in an address in which he stated the production to be 30,000 metric tons as compared with world production of 33,000 tons (his estimate). Prominent among the buyers of these compounds in 1928 were Denmark, 2,405 metric tons; Great Britain, 1,680 tons; Russia, 7,116 tons; China, 2,008 tons; Japan, 9,370 tons; Brazil, 3,287 tons; and the United States, 9,126 tons.

Professor M. C. Boswell, Faculty of Applied Science, University of Toronto, has discovered a catalytic process for the production of elementary sulfur from the sulfur dioxide of smelter gases, according to reports from Canada. If the process can be successfully applied commercially, it may mean that the $3,000,000 worth of sulfur at present consumed in Canada (most of it by the pulp and paper industry), may be obtained in that country instead of being imported from the United States as at present. Professor Boswell has forwarded a report of his investigation to the National Research Council at Ottawa, under whose auspices the work was carried out.

"NOW IT CAN BE TOLD"

Alex Fergusson's Story of the Philadelphia Chemical Trade

As Told to Williams Haynes

A strange chemical genius --- a record-breaking aniline oil order --- 80 per cent salt and 75 per cent profit --- a test lot of madder dye --- English vs. American soda ash --- out of a series of such anecdotes, Mr. Fergusson has painted a brightly-colored picture of the personalities and customs of the war-time and pre-war chemical trade in Philadelphia.

LAST winter a little $2,000,000 merger was announced that naturally did not attract a great deal of attention in these days of billionaire combinations"—in this wise Alex Fergusson began to reminisce over the bygone days.

"But," he continued, "it involves one of the most able and interesting personalities of all the remarkable assortment of men which the War brought into the chemical industry."

His friendly face broke into a broad smile and his eyes twinkled as he noted the mingled interest and curiosity he had aroused. We were at lunch in the grill of a Philadelphia hotel famous for its kitchen and for half an hour had been chatting of prices and peoples in the chemical trade when suddenly he seemed to remember the story he had promised to tell and without ado plunged into the middle of it in this original fashion.

"Do you remember that the typewriter ribbon and carbon paper business of the Neidich Process Company of Burlington, N. J. was sold to the Underwood-Elliott-Fisher interests for $2,000,000 cash?—at least so the papers had it." I nodded, and he went on, "Did you know that Samuel E. Neidich when the War shut off his supply of methyl violet, studied chemistry eighteen hours a day for six weeks and then bought from Calco $520,000 worth of aniline oil, the biggest contract then ever placed for this intermediate?" I shook my head. He leaned back in his chair, and I waited, for here was plainly a chemical story-teller who needed no prompting.

"Mr. Neidich is a curious genius. At Dickinson he finished two courses in three years with honors in both, and the President of the college has often said that he was by long odds the most brilliant student he ever had. The way he tackled the mastery of chemistry is quite typical. I don't mean, of course, that he became an expert chemist in six weeks, but he did acquire a sound working knowledge sufficient for him to find his way through the literature and enough so that he could judge a chemist's ability fairly and intelligently, which are accomplishments outside the repertoire of nine out of ten of our big chemical executives. About the same time and by the same concentrated method he learned German.

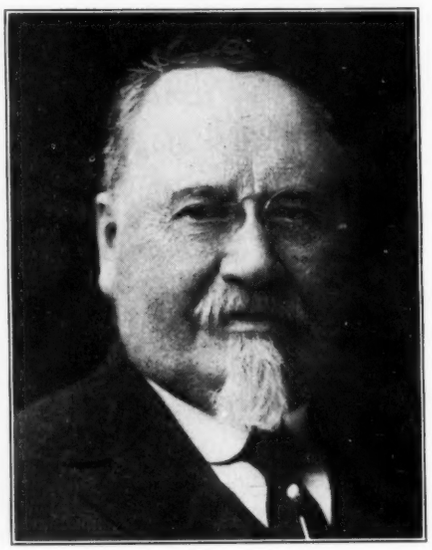
"Thus equipped and with the aid of half a dozen really good chemists he embarked on the manufacture of methyl violet. From the ground up the processes had to be worked out, and in doing so other dyes naturally were developed—methylene blue was one and there were half a dozen others.

"Early in 1916 I called on him regarding some matter of the School Board's affairs, and improved the opportunity as a representative of the Calco Chemical Co., by selling him the then record contract for aniline. That order naturally caught the eye of Miller Fargo, who was making a record for himself as an exceptionally able young sales executive, and he figured that a dye business that could use any such quantity of aniline oil was worth investigating. He soon found that Neidich, who was a babe in selling, was tied up with a complicated and unsatisfactory sales agreement with Charlie Orth of Marden Orth & Hastings, who was also selling agent upon very different terms for Calco. Mr. Fargo very neatly and kindly cut the knot Neidich had tied himself into by negotiating at a fair price the purchase of the Neidich dye business by his company, taking over some excellent processes and a couple of exceptional chemists, which was what Calco wanted, and assuring Neidich a supply of the colors he needed, which was what he wanted.

"Meanwhile Neidich kept on with his typewriter ribbon-carbon paper business, and all the while has been experimenting with artificial fibres. He has a score of basic rayon patents and for years he has been running a little plant making artificial horsehair for hat braids and trimmings. He is now reported to have invested some $600,000 of his two millions, in a larger plant, the old Taubel Mills at Riverside, N. J.

"This Riverside plant was till quite recently the largest mill of the largest manufacturer of hosiery in the country, for Taubel sold more than 25 million dollars worth a year and was the biggest buyer on the Viscose order books. When the vogue for full fashioned stockings came in, rather than re-equip with machinery they felt would only soon again be replaced by more improvements, they closed up and abandoned the business. During the War old Mr. Taubel figured in a chemical deal that his friends long twitted him about unmercifully.

"In the days of the dye famine one of the gyp dealers who was doing a flourishing business in colors that were 80 per cent salt and showed him about 75 per cent profit, sold Taubel a mongrel lot of dyes. The terms were $18,000 cash on delivery, and the dealer refused to accept the certified cheque their truckman tendered. So keen were they to get these dyes that Mr. Taubel himself rode back to Philadelphia on the truck, handed over the bank notes, and carried away the colors. That dealer was taking no chances on having a payment stopped on a check, $15,000 of which was probably clear, if not clean, profit.



Alex C. Fergusson, Sr., one of the outstanding figures of the chemical trade in pre-war Philadelphia

"A sort of reverse English of the Taubel experience in war-dyes befell Archibald McElroy who several years before had retired from the dyestuff firm of A. McElroy & Co. When he left business, either as a sort of souvenir or with some vague idea of doing some experimenting, he had carried home quite a collection of dye samples. These were discovered by his wife on a house-cleaning debauch, tucked away in the cellar, and he sold the lot for $600. It is pitiful to think how those little samples must have been eked out with salt and the price the ultimate consumers must have paid for them.

"Although, with Philadelphia's large textile industries dyes figured largely in the speculations of those riotous wartime markets, yet I remember vividly a carload of caustic which was sold five times in two days, twice by ourselves, and that caustic potash jumped from six cents to $1.00 a pound while red prussiate of potash leaped up from 20 cents to $6.00 a pound. This material—used largely in making blue print paper—attracted me into chemical manufacturing, and for a period I was the sole American source of supply. During the Fourth Liberty Loan campaign I obtained some information that convinced me the war would not last a great while longer, so I cut the price sharply to $2.00 and went out to sign up all the long term contracts I could corral. The day the Armistice was declared I shut down my tiny plant and began filling contracts out of stock. When this was exhausted I bought as needed from competitors who were using up their surplus of yellow prussiate. My last purchase was 12,000 pounds at 75 cents less 5 per cent. Throughout this period, contrary to a lot of talk we hear about bad faith, I suffered but one cancellation—through Roessler & Hasslacher for the account of a local blueprint company.

"Again a reverse English anecdote,—a short time before the outbreak of the war Roessler & Hasslacher had a pleasant reversion of this cancelled contract experience when Milton Kutz (then their Philadelphia manager) sold a dozen carloads of bleach to a consumer for monthly delivery. Through Joe Turner then of Riker, he made a covering contract for Niagara material; but after the delivery of the first car the market sagged off and the buyer cancelled. Mr. Kutz asked to be relieved, and Mr. Turner, quite within his rights, refused, although Roessler & Hasslacher in line with their liberal policy had accepted the stop order of their customer. Mr. Kutz was left with eleven cars of bleach on his hands in a weak market. But War was declared and the price of bleach started upwards with a rush. Back the customer scurried asking to reinstate his contract, which in the meantime had been placed elsewhere at an advance of several cents a pound. Riker never whimpered about a single monthly delivery nor did Roessler & Hasslacher miss a single re-shipment although the price continued throughout that year to climb up and up. Each could have made big extra profits: both scorned to do so, a nice example of the honorable spirit in which the old time companies kept the faith at a time when a flock of fly-by-nights, who did not know bleach from saccharine were making fortunes gambling in chemicals.

"It is certainly a telling commentary on the stability and reliability of the old established chemical houses to note that to-day—ten years after the war and despite all the turmoil of those topsy-turvey markets—that all the speculators who plunged into chemical trade have vanished and we have to-day just about the same competitors as before the War. General and Grasselli, Roessler & Hasslacher, Klipstein, Innis-

Speiden, and Lening, Mechling, Ellis Jackson, Harshaw, and Coyne—these are the chief factors, although there are a few newcomers.

Alex Fergusson smiled cheerfully and pushed his chair back; but I hastily asked a question that brought him back to conclude his string of anecdotes.

"Way back before the war," he repeated, "well, the whole character of the business was fundamentally different. The local distributor was then more of a broker and less of a sales agent or merchant. My father, Alex Fergusson, Sr. entered the trade through this brokerage door and first got his start thanks to a friendly tip from Clayton French's old bookkeeper. Father called on Mr. French, of French, Richards & Co., later Smith, Kline & French, among his first prospects since he was a leading figure and a big operator especially in drugs which in those days included natural dye-woods. Mr. French received him most courteously and said "Yes, I can use you and will be glad to give a young man a lift. It happens I have an odd lot of madder, only fifteen tons, I would like to turn into cash, and I'll give it to you to sell for me."

My father stepped out of the office highly elated; but as he passed by the bookkeeper asked him; "Did Mr. French tell you to sell some madder? Well, that's his test case—don't you come back till you've sold it, even if it takes three months, for if you do, you'll never do any more business with him."

"Three days later my father returned with a number of sales confirmations cleaning out the whole lot, and ever after that they were the closest of friends."

More Romance in the Old Days

"In the old days there was more of romance and adventure in the chemical markets. Business was more personal and yet interests were world-wide for there was more importing. All the alkalies, for example, came from England—Fergusson Brothers represented the Greenbank brand of C. Allhusen & Son; George Morgan represented Gaskell & Deacon; Hollingsworth & Perterson were Philadelphia agents for Wing & Evans, who in turn were American representatives of Brunner, Mond; and Ellis Jackson left Fergusson in 1892 to represent Edward Hill in this territory. My father also operated the Stag line of freight steamers between Newcastle and Philadelphia and a sample cargo would be something like this: He drew a paper from his pocket and read off: '600 casks of 1,400 lbs. each of bleaching powder; 3,000 barrels, sal soda; 1,000 casks (1,200 lbs. each) of soda ash; 500 drums (700 lbs. each) of caustic; 1,000 kegs of chlorate of potash; and 500 casks of bicarbonate of soda.' We also brought in heavy imports of sulfate of ammonia for the fertilizer trade; several thousand bags a month during the winter and early spring.

"Dense soda ash for the glass makers was an important item before American ash came on the market, and our last importation came in on the steamer 'Holkar' and consisted of a thousand casks which reached Philadelphia just after the American price had been cut so sharply that the imported material was unsalable except at a serious loss. We were saved this, however, by a lucky coincidence. Wire glass was invented just about this time, and one of the American makers brought over from England an expert glass-maker who cherished the firm belief that he could not possibly use with success anything but English ash. As the business grew our stock dwindled until just when it was about all used up we began educating this tenacious buyer to the use of domestic ash. Every American salesman had been dinning the same story into his ears and we made the switch at just the right psychological moment. I have never been able to determine whether this story illustrates better the Englishman's strength of character or my father's shrewdness as a chemical merchant."

Dead Sea Concession Agreement Signed; Operations Start in Fall

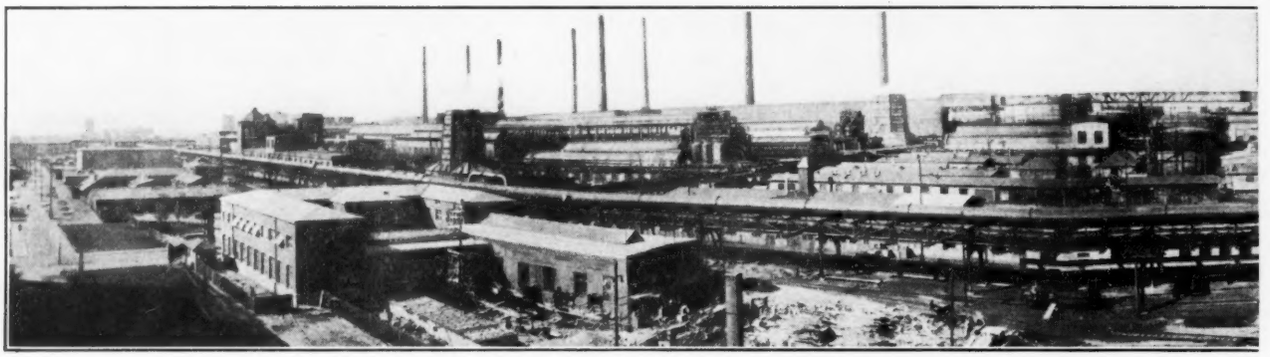
Dead Sea Concession agreement is signed in London, May 22, by the senior crown agent on behalf of the Palestine and Tranjordania governments and by N. A. Novomeysky and T. G. Tulloch for the concessionaires. Surveys for the prospective work will be begun immediately and operations will be commenced in the autumn.

The Earl of Lytton is to be the chairman of the board of the new company, and the directors will include Ernest Tennant, of C. Tennant, Sons & Co., and Bernard Flexner and Felix Warburg, chairman and vice-chairman, respectively, of the Palestine Economic Corporation of New York. The other financial supporters have not yet announced their directors.

Under the agreement the applicants will be required within 12 months of the date of signature to form a company either in Great Britain or Palestine, with a nominal capital of not less than £100,000, the prospectus and organization of this company to be under the supervision of the crown agents for the Colonies and the Governments of Palestine and Transjordania. Not less than one-half of any capital or debentures in excess of £250,000 shall be offered for public subscription and Palestinian citizens and Transjordanian nationals shall have a prior right to the allotment of not less than one-fifth of such public issue.

The principal provisions of the concession include the following: The concession shall be for a period of 75 years and an exclusive concession for the first 25 years. The company will be required to produce a minimum of 1,000 tons of potassium chloride of 80 per cent purity, or its equivalent, during the third year of the concession period, rising to 50,000 tons per year after the tenth year. Five per cent. of the value in bulk at the works of the potassium chloride, bromine and magnesium chloride produced will be payable as royalty. The Governments of Palestine and Transjordania shall share in the profits of the company on an agreed sliding scale.

"Azot" company Bory, Poland, which manufactures the yellow prussiates of soda and potash through the intermediate production of calcium cyanide in the Moscicki electric furnace, is commencing the manufacture of alkali cyanides. Eighty per cent. of the firm's total production of ferro-cyanides are exported and it is believed that a similar proportion will represent the export trade in cyanides.



SYNTHETIC

What the projected increase in nitrogen capacity means to markets and prices.

IN 1928, of the 1,844,000 short tons of nitrogen which was the world's estimated supply, more than half was of synthetic origin; a quarter was produced in the nitrate fields of Chile; and the same amount roughly, came from coal as by-product sulfate of ammonia. Of the synthetic nitrogen, about one-fifth was cyanamid, the rest in other synthesized carriers of nitrogen. Nitrogen from the air is now the leading source of supply, and is competing successfully with nitrogen from all other sources.

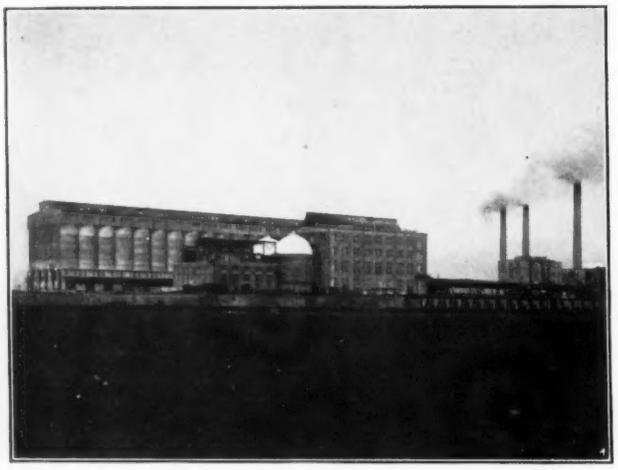
To Old School economists, this development would appear little short of marvelous, for to them it was axiomatic that a manufacturered product cannot compete successfully with a natural one. Yet in this country, we see the Atmospheric Nitrogen Corporation boldly investing many millions of dollars in a great synthetic plant, in which, among other materials, synthetic nitrate of soda is being produced to compete with the "natural" product from Chile. The American Cyanamid Company is greatly increasing its output, as are other companies. It is interesting to note that of the total world production of sulfate of ammonia about one-half is by-product, and the other half, which in the nature of the case must accept the same price as the by-product, is produced in the expectation that it can meet this price, and still show a profit.

It can hardly be expected that such a profound change in supply could be brought about without some significant effect on price. Changes there have been, not only in absolute money price, but even more markedly in relative cost to the consumer. Chilean nitrate of soda, for instance, is now offered at its pre-war price as against the 1928 index number of all commodities of 151. Sulfate of ammonia has suffered even more, and in the United States, despite a protective tariff of $5.00 per ton, was sold in 1928 at about 82 per cent. of its 1910—1914 price.* The failure of the price of Chilean nitrate to keep pace with increasing costs of production has embarrassed the Chilean Government exceedingly. So also has the fact that instead of having a monopoly of the world's supply of an essential commodity, that government now finds that it is dealing in a highly competitive commodity. With by-product sulfate of ammonia, the case is not nearly so serious, for ammonia in all forms constitutes not more than 20 per cent. in value of the total by-products from coking operations.

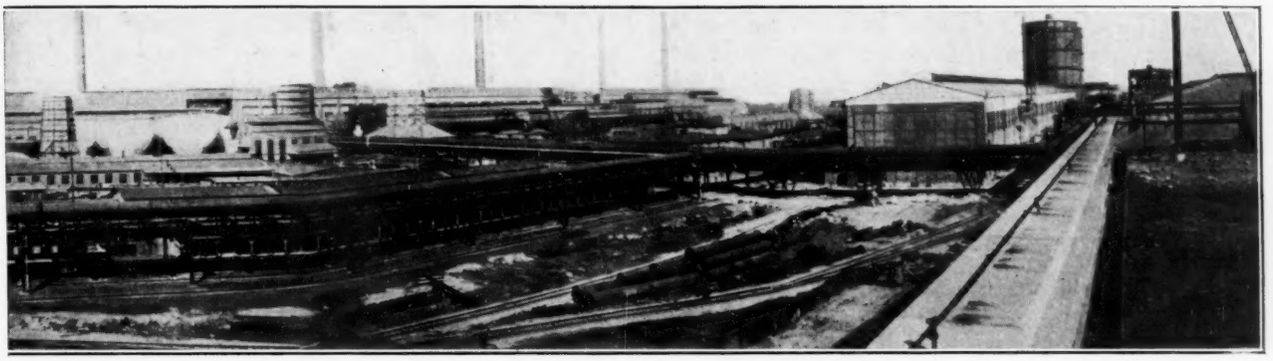
Now a by-product, economically, is peculiar. Years ago Washburn said, "A by-product cannot be driven out of the market by competition, nor is the quantity in which it is produced determined by the demand of it. It must be produced without relation to the demand, and must be sold without any relation to the cost." Therefore, no matter what happens to prices of other forms of nitrogen, the priority of by-product ammonia cannot be disturbed. Price competition with a by-product is impossible; but the effect of supply on the price of the by-product is perhaps the best index which we have as to the real effect of increase in manufacture of synthetic nitrogen.

Prices in terms of dollars and cents, or any other money unit, are a poor measure of the real cost of a product. The dollar fluctuates too much in buying power. From the standpoint of the greatest user of fixed nitrogen, that is the fertilizer industry, the best

**The picture heading these pages gives a panoramic view of the synthetic nitrogen works of the I. G. at Merseburg, Germany.*



Exterior view of the I. G.'s calcium nitrate plant at Oppau, Germany



NITROGEN

By Sidney B. Haskell and H. F. Mahle

*Synthetic Nitrogen Products Corp.**

measure of change is in terms of how much crop is required to buy nitrogen, for on this ratio, favorable or unfavorable as the case may be, depends the extent of use of fertilizer nitrogen. The cost of nitrogen in terms of the cotton, wheat, potatoes, or milk required to buy 20 pounds of this element wholesale, has been as follows:

Units of Crop Needed to Buy Twenty Pounds of Nitrogen

	Ammonia 1910–14	*Nitrogen 1924–28*	*Nitrate 1910–14*	*Nitrogen 1924–28*
Lint Cotton, lbs....	24.5	12.8	24.4	16.6
Potatoes bushels...	4.3	2.1	4.3	2.7
Wheat, bushels.....	3.4	2.0	3.4	2.6
Milk, quarts.....	35.2	18.1	35.1	23.5

Since 1920, the supply of domestic sulfate of ammonia in this country and Canada has increased about three-fifths. During the same period exportation of ammonia has fluctuated, but in the last year of record, 1928, has shown a rather marked decrease. Meanwhile the production of synthetic nitrogen in the United States increased to about 24,000 tons of 1928. The capacity of all plants completed or nearing completion is said to be in excess of 100,000 tons annually, or roughly sufficient to meet about one-third of the fertilizer nitrogen requirements of the country as they now are.

The two factors of increased domestic production and decreased exportation together with increase in world's supply, are responsible for the much more favorable price ratio, cost of fertilizer as compared with the value of crops, that our farmers are now experiencing.

Agronomists recognize three main chemical forms of nitrogen as used for fertilizer purposes:

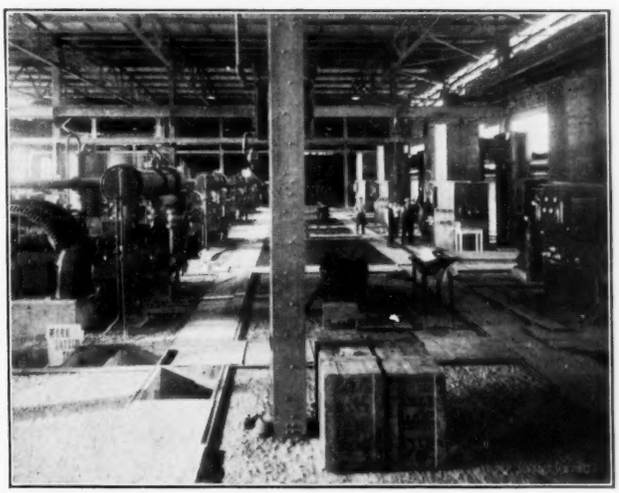
1. The nitrate form, in which nitrogen is certainly subject to loss by leaching—if and as leaching occurs, —and in which nitrogen is supposed to be immediately available to most crop plants

2. The ammonia form, certainly not so subject to leaching as the nitrate form, and under many conditions at least equally as valuable.

3. The organic form, which until recently consisted mainly of by-products. Chemically speaking however, in this last form must be included nitrogen fixed as cyanamid and as urea.

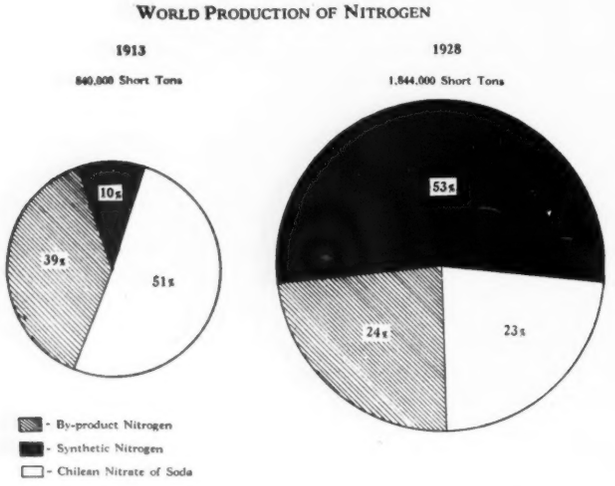
Figures available for 1927-1928 show that of the 1,590,000 short tons of nitrogen used in world agriculture, 920,000 was in the ammonia form, 460,000 in the nitrate form; and 210,000 in the form of cyanamid. Urea nitrogen is not classified separately, but is included as an ammonia form, as is the cyanamid nitrogen produced in Japan.

It is difficult at this time to prophesy as to the form of nitrogen which will be used in the future. Fundamentally, ammonia nitrogen is less costly than nitrate nitrogen, for in the usual process of nitrogen fixation, ammonia is first formed and then nitrate nitrogen produced by oxidation. This requires an extra manufacturing process, which naturally brings about additional cost. Ammonia nitrogen and to an even greater degree, urea combinations, are better suited for use in modern concentrated fertilizers than are the several forms of nitrate nitrogen, excluding the manufactured and at present rather costly potassium nitrate.



Interior view of the liquid air plant of the American Cyanamid Co. at Niagara Falls, Ontario

Future development in synthetic nitrogen manufacture for fertilizer will be governed by two forces; first, basic cost of production, in this country and abroad; second, requirements of American and world agriculture for nitrogen in these several forms. As far as agricultural requirements are concerned, climate, soil, crop and cost of nitrogen carrier, determine which form should be used. Agriculture in



different parts of the world has responded rather variedly to the situation.

In tropical climates, with sugar the chief crop fertilized, ammonia nitrogen is used almost exclusively, particularly where the cane is grown on irrigated land. There are definite biological causes for this, going back to the ability of the sugar cane to utilize ammonia nitrogen as such, the very rapid change in the soil from the ammonia to the nitrate form, consequent on high soil temperature and abundant moisture; and the loss by leaching of nitrate nitrogen.

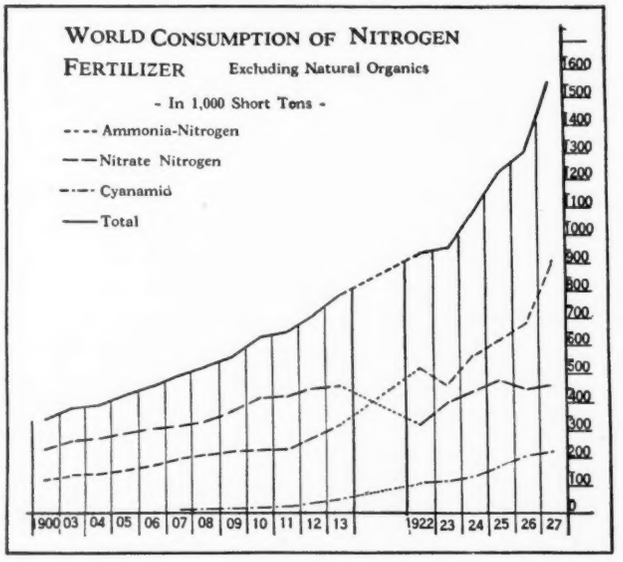
In semi-humid climates, and on dry soil, nitrate nitrogen seems to give the better results, for under such conditions there is no danger of leaching, and soil processes causing change in form of nitrogen go on very slowly. In temperate climates with favorable rainfall, crop preferences govern to a degree, as for instance the sugar beet prefers at least a part of its nitrogen to at least equal advantage. These crop differences, however, sink into insignificance in case the cost of nitrogen carriers varies widely. It follows, therefore, that the agricultural need for nitrogen in different forms cannot be the factor determining future forms of fertilizer nitrogen.

It is estimated that when plans now under way are brought to fruition, in 1930 or 1931, we will see a world production of synthetic nitrogen of 1,500,000 tons which will indicate an increase in world supply of this element of about 20 per cent. Meanwhile, there will at least be no decrease in production of by-product ammonia from the coking of coal, nor yet can there be expected any decrease in the attempt of Chile to sell nitrates. All of these facts put together, therefore, raise the question as to the future market for nitrogen of all kinds.

The greatest single market for nitrogen, synthetic or otherwise as the case may be, lies in fertilizer use. So recently as a year ago at the Second International Nitrogen Conference, F. C. O. Speyer of the Imperial Chemical Industries, Ltd., raised a question as to possibility of manufacture of synthetic nitrogen being overdone. Such a question is always in order, particularly as the great problem of American agriculture at the moment is the disposal of surpluses rather than the increase of production.

Increase in production of synthetic nitrogen will be a powerful factor in raising the standard of living on American farms, as well as in the world. Agricultural regions of the United States must have noticed the countless hours of human toil expended in growing crops on acres where yield is limited by lack of nitrogen. Those who are familiar with the wheat country from the Mississippi west to the semi-humid country, recognize the serious nitrogen problem which is coming in that great territory. The dairy farmers of northeastern United States are beginning to recognize shortage of nitrogen even on their pasture lands.

The market for nitrogen fertilizers in the United States has scarcely been touched. There are also other uses for nitrogen—in 1928 fully one-quarter of the nitrogen consumption in the country was used in industry—for refrigeration, in insecticides, for pharmaceutical products, in dyestuffs, as base for all explosives. There are large markets also in other



countries. Those who anticipate an overproduction of nitrogen fail to realize the immensity of the human loss and waste now caused by a lack of this essential commodity.

I. G. Farbenindustrie is granted British patents on its synthetic rubber under British Patent numbers 283,840 283,841. The process involves an emulsification and polymerization in presence of oxygen or oxidizing agents of butadiene, dimethylbutadiene and isoprene. Emulsifying agents may be soap solutions, albuminous substances, salts of sulphonated fatty acids, saponin, water oil suspension, etc. The addition of a small quantity of potash assists the action of the oxidizing agents, says the Department of Commerce.

OUR EXPORT TRADE

After Ten Years' Operation of

THE WEBB LAW

By William Notz

It is doubtful that anyone questions the fact that the American chemical industry must look with increasing interest to the development of foreign markets as the source of much of its future welfare and growth. Legislated primarily as a war-time measure, the Webb-Pomerene law has been in operation for a decade and this article by a one-time senior economist of the Department of Commerce, and reprinted from "The American Economic Review", is noteworthy in that it traces the accomplishments of American exporters under this, "An Act to Promote Export Trade". In it, Dr. Notz also points out that the Act has in course of operation developed along certain lines which may prove forerunners of further important developments in the field of economic legislation.

IT IS almost ten years since the Export Trade act (Webb-Pomerene law) was enacted by Congress, so that a fairly good idea of its practical operation can be had.

This statute which permits the formation of export associations, and with certain restrictions exempts them from the Sherman anti-trust law, was in a sense a war-time measure, having become a law on April 10, 1918 (40 Stat. at L. 516-18). However, the ideas underlying it antedate the war, going back to a study of foreign cartels and combines by the United States Bureau of Corporations in 1914. The wave of interest in foreign trade which swept over this country following the outbreak of the war, focused attention on foreign cartels as a means of aiding our export business. The newly established Federal Trade Commission issued a report in 1916 on *Co-operation in American Export Trade*, in which it recommended that Congress "enact declaratory and permissive legislation to remove the present doubt as to the (Sherman) law and to establish clearly the legality of co-operating in export trade." American exporters, especially the smaller manufacturers and producers, the Commission urged, should be enabled to compete in foreign markets on more nearly equal terms with foreign competitors. For this purpose the formation of export associations should be permitted by law.

In the hearings and debates on the bills introduced by Representative Webb and Senator Pomerene, during the Sixty-fourth and Sixty-fifth Congresses, considerable emphasis was laid on their alleged defensive purpose against foreign cartels and combines which were said to be chiefly aggressive organizations over against which the individual American exporter was at a disadvantage.

Objections that legalized export associations would become instruments of oppression, repugnant to the public interest, that such legislation would lead to a breakdown of the Sherman law and would open the door to monopolisitc agreements affecting the domestic market of the United States, were met by inserting certain safeguarding clauses into the bills. These provide that export associations operating under the Act shall be restricted to American export trade exclusively; that they shall not engage in unfair competition against other American competitors engaged in export trade; that they shall not artificially or intentionally enhance or depress domestic prices or substantially lessen competition or otherwise restrain trade within the United States.

In case an association should fail to comply with these requirements, the Federal Trade Commission was empowered to recommend a business readjustment in accordance with law, and, if not complied with, to refer its findings and recommendations to the United States Attorney General for appropriate action.

Each association is required to file with the Federal Trade Commission, within thirty days of its organization, and annually thereafter on January 1, a copy

of its charter, by-laws and agreement, together with the names and addresses of its officers and stockholders or members. This has been done during the period from April 10, 1918, to July 1, 1928, by a total of 156 alleged export associations. The number on file at the present time is fifty-six. That leaves 100 which have either withdrawn, consolidated or gone out of existence. The total number on file for each year from 1918 to 1928 was as follows:

1918	48	1924	50
1919	58	1925	50
1920	43	1926	51
1921	48	1927	55
1922	46	1928	56
1923	55		

A number of factors account for the seemingly large mortality rate. Principally this, that many concerns which in the early years of the law filed papers, apparently did so due to a lack of understanding of the requirements and purpose of the Act. Not being sure of their stauts, they reported rather than risk coming under the penalty provisions of the Act. Most of them were not combinations made up of competitors at all, and needed no exemption from the Sherman anti-trust law. Some were ordinary import and export commission houses. Others represented more or less adventurous enterprises seeking publicity. None qualified under the terms of the Act. In several cases the reduction in number was due to reorganization and consolidation.

Advantages of Export Co-operation

Among the advantages accruing from co-operation as carried on under the Webb law, according to data furnished by associations, are the following: stabilization of prices by preventing underselling; reduction of overhead expense, selling costs, etc.; standardization of grades, contract terms and sales practices; centralized inspection of shipments; consolidation of shipments; joint market surveys and development of new markets; centralized handling of claims; elimination of excessive credit terms; facilities for accepting and handling of large orders, varieties of grades, styles and dimensions and allocation among the association members. Other advantages reported include, "the ability to present a solid front to foreign competitors and to satisfy foreign buyers and gain their confidence who know that they are dealing with a responsible organization."

Over against these advantages certain handicaps have been noticeable. As far as export commodities are concerned, raw materials (lumber, minerals, grain) have lent themselves most readily to export syndication. Manufacturers of trade-marked goods have not responded thus far to efforts from their midst to combine for export. Fear that the good-will of their established brand or mark and the individuality thus created would suffer, that their particular line would not be sufficiently "pushed," etc., are some of the reasons that have been advanced in opposition to co-operative action by manufacturers of well-known branded wearing apparel and finished goods. On the other hand, the use of joint export trade-marks has been successful in case of commodities like lumber, where the products of the individual members are all alike and can be easily sold under a joint trade name. The "Wesco" brand of the Walnut Export Sales Company serves as an example of a successful joint export trade-mark.

Experience also shows that it is difficult to procure harmonious co-operation where the member concerns are of unequal size. In such cases the smaller concerns are likely to make unreasonable demands for quota allotments and concessions of all kinds, to accuse the larger members of endeavoring to domineer, etc. Business rivalry, disagreements and unwillingness to co-operate develop frequently also where an association has a large membership of small concerns.

Further difficulties with which export associations have had to cope consist in unwillingness of individual members to abide by price agreements in time of business depression, and in competition from outsiders who are unwilling to join, yet take advantage of benefits resulting from associated effort of others.

Problems of Practical Application

No sooner had the Webb act become operative in 1918 than numerous problems arose as to its practical application. One of these had to do with exporting to the Philippines and Porto Rico. Several associations desired to sell goods in those markets. Whether or not it was legal to do so depended on the interpretation given to the term "Territory" in Section 1 of the Act. It is there provided that export associations shall not produce, manufacture or sell for consumption or resale within the United States or any Territory thereof. An examination of the court decisions, etc., covering this point showed that export to those markets is not permissible under the Webb act.

Another problem which came up at different times and in varied form dealt with the question of price fixing. Do associations qualify under the Act whose activities consist exclusively or essentially in fixing export prices? The wording of the Act itself in this respect is not as clear as it might be. It merely provides that associations shall be formed for the sole purpose of engaging in export trade and shall actually engage solely in export trade. The words "export trade" are defined as "trade or commerce in goods, wares or merchandise exported or in the course of being exported from the United States." In the course of the debates in Congress on the Webb bill the proposed export associations were currently

referred to as "selling agencies" and the opinion apparently prevailed in both houses that the proposed export associations should sell goods and not operate merely as price-fixing groups. This view was upheld by leading attorneys and others, including Judge Webb, whose opinions were requested on this point. The Federal Trade Commission, without issuing a formal ruling, for a time held the same view. The assumption was that an export association as such should engage in exporting, that is selling, and that if the latter was being done by the individual members, while the association merely fixed prices, such an association did not comply with the Act. Moreover, it was felt that the control over mere price-fixing associations would involve administrative difficulties. Opponents of the Act claimed that associations of that type would readily lend themselves as a cloak for domestic price fixing and restraint of trade and would lead to a breakdown of the Sherman law.

The whole matter was eventually placed before the Federal Trade Commission for a definite ruling on December 13, 1923, by a committee of silver producers. The Commission held as follows: "The Act does not require that the association shall perform all the operations of selling its members' product to a foreign buyer. It would seem that an association may without necessarily involving conflict with the Act, engage in allotting export orders among its members and in fixing prices at which the individual members shall sell in export trade." The Commission's answer, not unanimous, was dated July 31, 1924.

That opinion has had a vital bearing on the subsequent formation of associations under the Act, and involved a very important change in policy. Although the wording of the opinion is not entirely clear, it has been taken for granted since then that price-fixing associations would qualify under the Act. The associations subsequently formed were for the greater part essentially price-fixing and not selling combines, the selling and exporting being done by the individual members.

Relationships With Foreign Combines

A further important development, growing out of the aforementioned ruling of the Federal Trade Commission, has to do with the linking up of Webb associations with foreign combines or individuals, and thus becoming parties to international cartels. In the course of the above-mentioned ruling by the Commission, of July 31, 1924, it was held that: "There seems to be no reason why a Webb-Pomerene association composed of nationals or residents of the United States and actually exporting from the United States, might not adopt a trade arrangement with non-nationals reaching the same market, providing this market was not the domestic market of the United States and the action of this organization did not reflect unlawfully upon domestic conditions."

In view of the increasing number of international cartels since the World War, the far-reaching consequences of the Commissions' ruling can hardly be foreseen at the present time. How far export associations may go in this respect without violating the Webb law as well as the other anti-trust laws remains problematical, and may ultimately depend on the attitude taken by the courts, who up to the present time have not had occasion to pass on any problems connected with the Webb act.

Thus far the Federal Trade Commission has entered proceedings against one association, alleging a violation of Section 5 of the Federal Trade Commission act, and charging that the defendant party by reason of its policy and plan of business was not an association within the meaning of the Webb act. After a lengthy investigation the complaint was dismissed. One of the practices of this particular association to which exception had been taken was the fact that it did not itself export but sold its products through export commission houses. The Commission held that "the consummation of a sale within the United States, if the product sold is intended for, is actually marked for, and enters into export trade, is in the course of export within the meaning of the Act."

On another occasion the charge made against Webb export associations in general of engaging in dumping American goods in foreign countries in order to keep prices high to consumers in the domestic market was, upon investigation, found to be unwarranted.

Stabilized Prices Encouraged

Concern has been expressed at different times that the Webb act might be used for price manipulations detrimental to the public welfare. Insofar as export prices are concerned, price stabilization has been one of the main objectives of most associations. It has been successfully accomplished in those cases where the members of an association dominate the export business of their respective industry. In some instances even small outsiders have been able to disarrange price levels. Export price agreements, are aimed at elimination of underselling and not at imposing excessive or monopoly prices on foreign buyers.

Regarding domestic prices, the Act itself contains provisions applicable to efforts to enhance or depress prices within the United States, and no complaints have been made thus far. It is quite conceivable, however, that the present tendency of bringing an entire industry into an association of large, trust-like corporations combining under the Act, and of co-operation with foreign combines may lead to arrangements injuriously affecting consumers' prices here and abroad.

For a time the Webb act was viewed with considerable alarm in foreign countries, particularly in South America and Australia. It was considered a trade weapon designed to aid American trusts in

destroying foreign competitors and capturing world markets, and figured freely in tariff campaigns abroad. In European countries much stress was laid on the alleged inconsistency of prohibiting combines within the United States but legalizing and promoting them when engaged in export trade, of protecting one's own citizens against monopolistic exploitation but giving the trusts free rein against foreigners. However, thus far, no complaints as to unfair acts on the part of Webb law associations in foreign countries have become known. On the contrary, the provisions of the Webb act requiring all associations to file copies of their agreements, lists of members and stockholders with a governmental agency, and placing them under governmental supervision has been quite generally regarded as a feature of the Act and as a forward step in placing international commercial relations on a higher plane. This plan has been followed in several foreign countries. The recent *Report of the Liberal Industrial Inquiry of Great Britain* recommends a similar procedure for Great Britain.

Recent Entrance of Large Exporters

It is significant that until recently, outside of the lumber industry, few of the larger American industrial concerns whose products go into export trade, have made use of the Export Trade act. The main reason for this is that having well-established export channels of their own they were not in need of combining with competitors. Since the above-mentioned ruling of the Federal Trade Commission approving of price-fixing associations under the Webb act, a change has come about. It was hastened by the fact that overproduction became a serious problem in many industries, and the need for outlets to foreign markets made itself felft increasingly. Agreements as to minimum prices, uniform sales conditions, division of markets, etc., now became more desirable, and so it came about that some of the largest concerns in the sulfur, sugar, copper, zinc and lately the steel industries have taken advantage of the Webb law. In a sense this is a development out of line with the expectations of the early advocates of the Act, who had designed it as an aid to small American exporters.

During the decade that the Act has been on the statute books the need of amending it has been voiced several times. In most instances, however, such alleged need was expressed by professional writers, who apparently offered suggestions of all sorts without careful investigation or knowledge of the facts. They did not emanate from existing export associations, as was shown by inquiries made by the Export Trade Division of the Federal Trade Commission. Thus it was claimed that export associations should be permitted to operate shipping lines, to import goods, etc. As to the latter point, the only request of that kind came from an association which as a matter of speculation had exported blankets of an inferior quality and finding no market abroad wished to bring them back again to this country.

The matter of amending the Act, so as to allow importing, did come up more recently, but in an entirely different connection. It was wholly alien to those who drafted the Webb law, and who restricted it in specific terms to export trade. The only change in the Act favored by some associations operating under it and by concerns who wished to avail themselves of it, dealt with the matter of price fixing, which was finally acted on by the Federal Trade Commission. A bill which Senator Fletcher introduced in the Senate contemplated a similar change.

The nearest approach to amending the Act was in 1928, in connection with the Capper-Newton bill. It would amend the Webb act so as to permit the formation and operation of associations for importing crude rubber, potash, sisal and other raw materials or products of nature, certified by the Secretary of Commerce to be of a character not made, produced or grown in substantial quantities within the United States or to be controlled by any foreign government, combination or monopoly. The bill (H.R. 8927, 70th Cong., 1st Sess.) was defeated in the House on April 6, 1928, following closely upon the announcement of the discontinuance of the British rubber monopoly, against which it was aimed principally.

Summary of Net Results of Webb Law

In summing up the net results of the Webb law, as analyzed above, the fact stands out that the volume, value and diversity of commodities exported thereunder have increased steadily and appreciably during the decade of its operation. Moreover, a goodly number of concerns, large and small, located in every part of the country, and affiliated with representative industries, have availed themselves to the facilities of the Act. Furthermore, Webb associations have reported noteworthy practical benefits, in business policy and administration, in export merchandising and along financial, technical and other lines, attributable directly to concerted action as legalized by the Act.

While extravagant expectations of some erstwhile proponents have not been realized, the harmful consequences feared by its opponents have also failed to come true. In fact, the Act has in course of operation developed along certain lines—legal, economic and technical—which were not foreseen at the time of its enactment, and which may prove forerunners of further important developments.

Taken all in all, it seems fair to conclude that the Webb-Pomerene law has provided, thus far, a serviceable piece of legislation, and has within reasonable bounds accomplished what its name proclaims: "An Act to Promote Export Trade."

Making and Grading Industrial Alcohol

By H. W. Haines
U. S. Industrial Alcohol Company

INDUSTRIAL alcohol is the term applied to ethyl alcohol, either pure or denatured, for lawful manufacturing or medical purposes.

Production and sale of alcohol, regardless of source, raw material or quality, are under strict Government permit and supervision which virtually serves as a guarantee that the commodity when it leaves the plant, conforms to established standards of formulation and strength. Broadly considered the Government does not interest itself in the purity of industrial alcohol beyond checking the quality and quantity of the denaturants added—and, in the case of tax-paid alcohol, the actual alcohol strength for the imposition of the Internal Revenue tax. As a matter of fact, according to current regulations, all alcohol is subject to tax the moment it comes into existence, which tax is later assessed, or cancelled off when the spirit is released for denaturation or tax-free uses.

Regulations divide industrial alcohol under three heads, pure (tax-paid and tax-free), specially denatured and completely denatured which enter industry as follows:

Pure (a) Tax-Paid—Permit required. Uses: medicines, flavoring extracts, etc.

(b) Tax-free—Permit required. Uses: To hospitals, colleges, research laboratories, and similarly organized institutions.

Specially Denatured — Tax-free, but permit required.

Note: This group of alcohols, numbering over one hundred, are particularly denatured to serve many industries individually.

Uses: Shellac, spirit varnish, rayon, perfumes, tooth paste, lotions, lacquers, solvents, fine chemicals, etc.

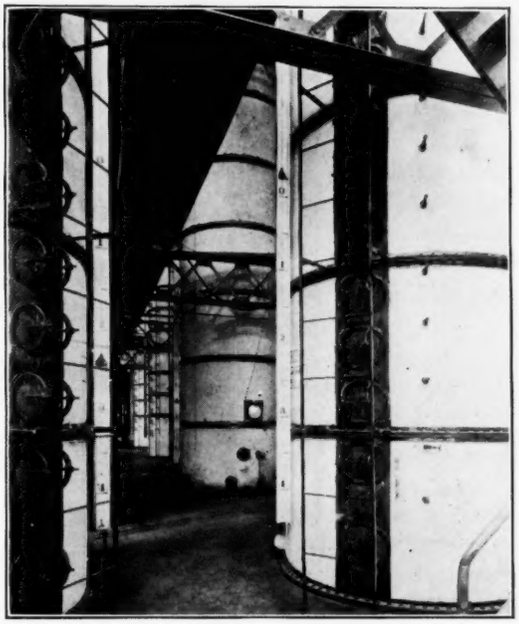
Completely Denatured — No permit required.

Uses: Anti-freeze for automobiles, shellac and spirit varnishes, fuel, cleaning, etc.

Alcohol may be made from many vegetable substances including sugar (cane or beet), all grains, starches and starchy materials, cotton and even wood, by fermentation with yeast under favorable conditions. All do not ferment with equal readiness. In the case of wood or cotton, preliminary chemical treatment is necessary to degrade the fiber to the status of a simple sugar, which is then acted on by the yeast. In like manner complex sugars and starches are not immediately fermentable—the first action of the yeast being to convert the starch into sugar, later followed by true fermentation.

In the commercial production of industrial alcohol, obviously the cheapest raw material is chosen—that is, the one most readily available, of lowest price, largest supply, and giving the greatest alcohol yield without undue cost of manufacture. Good alcohol may be made from any of the aforenamed substances by using sufficient care, expense and equipment in the process but as a profitable commercial enterprise, the choice is narrowed down to molasses (cane or beet) and corn.

The major production of alcohol is from molasses,—commonly known as "blackstrap." At the sugar plantations in Cuba and Porto Rico the main sources of supply—the sugar cane juice is concentrated, and successive batches of crystals of raw sugar removed by crystallization. A point is finally reached when it is no longer practicable to exhaust the syrup further owing to the accumulation of uncrystallizable sugar and impurities. This resulting product is "blackstrap", a heavy, black, tarry looking substance quite different from the light brown "edible" molasses with which we are all familiar in the household. Blackstrap is collected in tank cars at the plantations and shipped to tidewater, where it is transferred to tank steamers which deliver it to the alcohol plants.

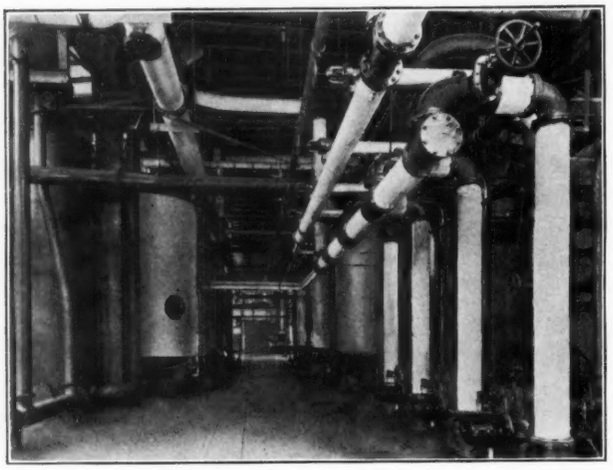


Distilling columns which act as rectifiers to remove impurities

On arrival the molasses comes immediately under Government supervision. It is measured and pumped into huge

storage tanks under lock and key—and remains under strict surveillance as it goes through the plant.

A batch of molasses is run into the "fermenters"—huge iron tubs, and warm water added to reduce the sugar to fermentable strength. Yeast is added and fermentation begins, slowly at first but with increasing rapidity so that after eight hours or so the solution



An interior view of the first floor of the still house of the Baltimore plant of U. S. Industrial Alcohol Co.

appears to be boiling due to extensive liberation of carbon dioxide gas—the natural by-product of this class of fermentation. After 24-36 hours, the charge quiets down and the first stage is finished. At this point, the "beer" contains 6-8 per cent of alcohol.

From the fermenters the "beer" is pumped to stills for the first rectification. These stills may be of the batch or continuous type (usually the latter). The vapors are passed up through specially designed rectifying columns which wash out most of the impurities—and yield a spirit about 65 per cent. pure, known as "high wines". These "high wines" are charged into a separate still and again rectified through a column of many plates and highly specialized construction. In this operation, the effluent alcohol varies slightly in composition reaching its highest quality in the middle of the run, whence the name "middle run" goods, or "cologne spirits." The alcohol other than "cologne spirits" is used generally for the completely denatured grades.

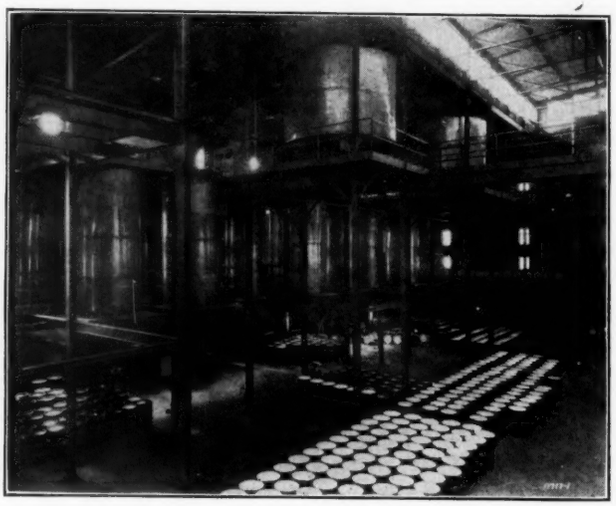
In the production of alcohol from corn, (so-called "grain alcohol"), the grain is ground, and boiled until it is completely disintegrated,—this "mash" is then run into the "fermenters", yeast added—and the fermentation proceeds exactly as with molasses. After distilling the "beer", the residue in the still is separated out and the solid matter sold for cattle feed under the name "brewer's grains."

Both molasses and corn yield a spirit of high purity, when properly fermented and efficiently distilled. Even under the most exacting chemical tests, it is virtually impossible to tell whether the alcohol is derived from molasses or grain, particularly the "cologne spirits" grade which all producers set aside for "tax-paid" uses and other discriminating trade. In the present perfection of distilling equipment and close technical control, the character of the raw material is less important than heretofore.

The naturally occurring impurities (other than water) in alcohol in the "beer" state, are fusel oil (amyl alcohol), aldehydes, and traces of complex organic substances, which when not entirely removed, impart a foreign taste or odor—and react chemically with reagents used for testing. Fusel oil is readily stripped out in the average column but the elimination of the other by-products is less easily accomplished. The best efforts of designers and physicists have been expended in the construction of columns which will give a high degree of rectification and removal of the last traces of impurities. Such apparatus is now a part of every well equipped distillery.

Owing to the presence of denaturants in all complete and special formulas, analysis and testing of these types would be very involved and for the most part, unnecessary. As pointed out previously, the Government in essence, guarantees the composition—and checks the quality and quantity of the denaturants used so that all a buyer need concern himself about is the proof or actual alcohol strength, which figures are officially given in Department bulletins—as well as in manuals issued by practically all of the representative alcohol manufacturers. Further, the regulations stipulate that every wholesale package of alcohol, shall bear significant markings indicating the producer, origin, formula and number of wine gallons.

The testing of alcohol can best be approached by a consideration of the characteristics of the pure product, which is officially covered by specifications in the



Interior view of a denaturing unit of the plant.

U. S. Pharmacopoeia. These comprise tests for proof (strength), odor, acidity, residue, fusel oil, carbonizable impurities, aldehyde, tannin, methanol, acetone. The user of pure alcohol for extracts, medicines and proprietaries, as well as the laboratory worker in pure science, is vitally interested in securing a spirit which shall conform to these specifications for many times

traces of impurities will affect the odor or appearance of the finished commercial product—and obscure or distort delicate chemical reactions. For example, a trace of iron in solution will distinctly discolor a hair tonic which contains alcohol and sodium salicylate—and in photographic emulsions, a trace of aldehyde will injure the photographic properties of the sensitized film. Practically all firms where purity of alcohol is of prime importance, maintain rigid chemical inspection to check the quality of the spirit before it goes into manufacturing operations.

Ethyl alcohol contracts when mixed with water—thus one pint of pure alcohol and one pint of water will not make one quart when combined. This has doubtless given rise to the two systems of describing the strength of alcohol, viz., percentage by weight and percentage by volume. In the higher strengths, these differences are appreciable, for example 92.4 per cent. by weight is equivalent to 95.0 per cent. by volume.

Determining "Proof" of Alcohol

"Proof Spirit" (U. S. Standard) is ethyl alcohol of 50 per cent. by volume strength. The term comes down to us from the ancient English system of testing alcohol by pouring on gunpowder and igniting. If the alcohol set fire to the powder, the spirit was called "proof spirit." Later, more scientific methods established this strength at 57.1 per cent., by volume, but so deeply fixed is this nomenclature, it persists to this day. The English still say so many degrees under or over proof—and in the U. S. all production is based on "proof gallons", that is, gallons of exactly 50 per cent. by volume strength.

The strength of pure alcohol is determined by the specific gravity, that is, a comparison of the weight of a definite volume of spirit with the weight of an equal volume of water at standard temperature usually 60°F. Very accurate tables have been compiled by the U. S. Bureau of Standards, so that once the specific gravity is obtained, a reference to the table will indicate the exact percentage of alcohol or proof.

After specific gravity, the most important test is odor. In fact it might be said that odor is pre-eminent as it may almost be taken for granted that the strength is standard when the spirit is purchased from a responsible distiller. Although the human nose is both a reliable and an unreliable organ of perception no laboratory test can take its place—and many shipments of alcohol have been accepted or rejected solely by the sense of smell, even though satisfactory on strictly chemical examination. Good odor is most important for the perfume industry—and while little pure alcohol as such is devoted to this use (an entirely satisfactory special formula being available) the alcohol before denaturing must be as nearly odorless as possible. Here it is that the care and efficiency in manufacture become apparent. Only "cologne spirits" or "middle run" goods is used for the high class industrial trade where good odor is a prime requisite.

Pure alcohol for medical and research purposes is subjected to and must pass every requirement of the Pharmacopoeia. In the industries using specially denatured alcohol, particular attention is paid to checking the absence of traces of impurities which might affect the quality or yield of the finished product. As mentioned previously, this is very necessary in the photographic trade, where even minute amounts of aldehydes might deteriorate the emulsion. Ether and ethylene (important surgical anesthetics) are made from alcohol which must be very pure in order not to introduce dangerous by-products. Alcohol used in meat branding inks must be proven free from methanol (wood alcohol). Practically every industry has its own qualification to which the supply of alcohol must conform—and the higher the quality of the finished merchandise, the more exacting are the tests.

Though not officially listed, a very simple, satisfactory and generally conclusive test for reducing compounds (aldehydes, carbonizable impurities, etc.) in pure alcohol is as follows:

Prepare a solution of potassium permanganate by dissolving .02 gr. permanganate in 100cc distilled water. Add 2cc of this test solution to 50cc of the alcohol to be examined and allow to stand at 60°F in diffused day light (not direct sunlight). At the end of 50 minutes the characteristic color of permanganate should still be evident. Obviously, this test permits of some latitude by reason of the personal equation of the observer but on a spirit of poor quality the color may be entirely discharged in far less than the 50 minute period and no difficulty experienced in properly interpreting the result. A test of 40 minutes can be considered acceptable, 50 minutes usual for a good grade of spirit—and some runs may show as high as 60-70 minutes. In experienced hands, this test is easy and significant.

French and Belgian salt cake (sodium sulfate) producers are about to enter an international convention, so far confined to the Germans and British, to allocate export markets. The combination would represent a total of about 590,000 metric tons of product, divided as follows: Germany, 290,000 tons; England, 150,000 tons; Belgium, 80,000 tons, and France, 70,000 tons.

The Anglo-German agreement on salt cake markets has been inn effect sice 1925 to run to 1930, but this will more than likely be extended to 1935. It reserves British markets to England; German, Czech and Austrian markets to Germany, with a 40-60 (English-German) division on all other export markets.

With the Belgian and French producers included, Belgium is accorded 30 per cent of its home market and 20,000 tons for export, while France sells its own country and is allowed 12,000 tons for export. Both Belgian and French export stocks are to be sold by the Sulfat-Vereinigung (German sale cake cartel) of Frankfort on the Main, reports Trade Commissioner William T. Dougherty, Berlin.

I. G. Farbenindustrie is now producing 700,000 metric tons of nitrogen annually, of which 570,000 tons is produced at the Leunawerke and 130,000 tons at Oppau, according to a statement appearing in the German press.

How Solvent Production Kept Pace With the Demands of the LACQUER INDUSTRY

By J. G. Davidson
Manager Chemical Sales,
Carbide and Carbon Chemicals Corp.

IN 1922,—only seven years ago—automobiles were finished with oleo-resinous varnishes and enamels, and the average time required completely to finish a body was between two and three weeks. At that time the automotive industry had already become one of the major manufacturing industries and a potent factor in our economic life. With increased production, the storage space required for bodies in process becomes a great that it became necessary to find new finishing materials or to provide enormous additions to the existing plants, which would, in turn, require the investment of large sums of money. Fortunately for the automobile industry, considerable work had been done toward developing nitrocellulose finishes during and since the World War, and this urgent demand for quick drying protective coatings brought into commercial production materials which might otherwise have been much longer in finding their way into the market. The result is that automobiles are now finished with nitrocellulose lacquers and the time required for finishing has been reduced to less than two days.

Of course, certain types of nitrocellulose products had been made and used for a number of years prior to this, but it was really the necessity for greater speed of finishing and greater hardness of finish in the automobile business that brought about the phenomenal development of the now well-established lacquer industry. There were a number of other factors contributing to this sudden transformation of the protective coating industry, however. A certain demand is not all that is necessary to bring about such a profound change in one of our basic industries,—there must also be a wherewithal, a supply of materials from which to produce the required end. The new materials, or tools, had just been discovered in the newly developed stable nitro-cellulose of low viscosity, and in the new synthetic solvents for it.

If the industry had to depend upon the supply of amyl acetate formerly available from fusel oil it would never have grown to its present dimensions. It is to the timely development and commercial utilization of such processes as the fermentation of corn to produce butanol, and the synthesis of the glycol ethers and amyl alcohol that we owe the continued growth of the lacquer industry as we know it to-day.

Thus, a new and large demand for a product which demand could not be served with the then sources of existing raw materials, called upon the ingenuity of chemists and chemical engineers to produce new raw materials having the required properties or new methods of making the old products. This demand and the answer to it have created the nitrocellulose lacquer industry as we now know it along with a host of inter-dependent or contributing industries.

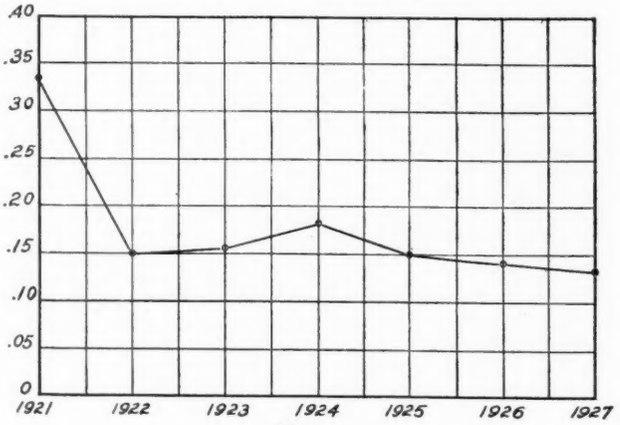


Fig. 2.
Price per Pound - Aliphatic Chemicals.

Figures compiled by the U. S. Tariff Commission, show a startling increase in the production of non-coal tar synthetic chemicals in the last seven or eight years. In passing it should be remarked that, while coal tar products such as toluene and xylene play an

important role in the manufacture of lacquers, it is really the aliphatic, or non-coal tar products, which are the active nitrocellulose solvents. During the years 1921-1927 the production of non-coal tar chemicals increased from somewhat over 21,000,000 pounds to nearly 261,000,000 pounds, a thirteen-fold increase—while the production of finished coal tar chemicals increased from approximately 50,000,000 pounds to less than three times that quantity. The annual production figures for non-coal tar chemicals, finished coal tar chemicals, and coal tar intermediates are presented graphically in Figure I.

In recording these figures, and remarking upon the increase in production of aliphatic organic chemicals, the Tariff Commission says:

> "One of the principal uses of the non-coal tar synthetic organic chemicals is as solvents in the manufacture of nitrocellulose varnishes and lacquers. Among the important solvents showing a large increase in production (in 1927) are butyl and amyl alcohol. The principal esters of these alcohols, butyl and amyl acetate, showed a decline. The increase in production of ethylene glycol and like derivatives of ethylene was phenomenal. New products of this type are being developed and promise extensive and varied uses."

Data on the quantities of nitrocellulose lacquers manufactured have been included with varnishes, etc. until the last two or three years, so we are unable to study the growth of this industry as a separate factor.

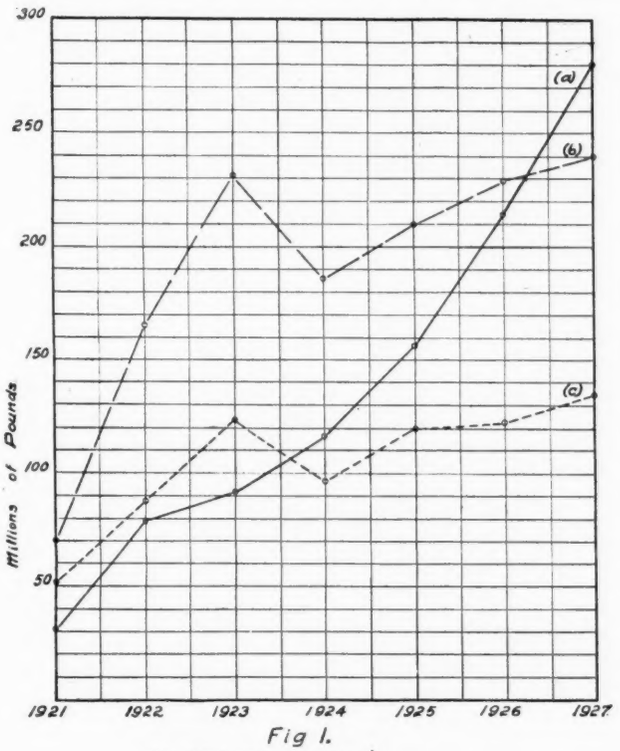


Fig I.
(a) Aliphatic Chemicals.
(b) Coal Tar Intermediates.
(c) Finished Coal Tar Chemicals

However, the census figures show that the production of nitrocellulose lacquers and thinners increased from 25,000,000 gallons in 1926 to over 29,000,000 gallons in 1927. In 1927, there were 9,637,400 gallons of thinners manufactured, and 19,650,200 gallons of other lacquers. We may safely assume that the average specific gravity of the thinners is 7.2 lbs. per gallon, and of the other lacquers about 8.1 lbs. per gallon. The lacquers will, furthermore, contain approximately 75 per cent. solvents, by weight. From these assumptions we may calculate that about 189,000,000 lbs. of volatile solvents were used in the lacquers manufactured in 1927. About 60 per cent. of this quantity was of coal tar origin, leaving 40 per cent. or 75,600,000 lbs. of non-coal tar synthetic chemicals. When we compare this figure with the total production of synthetic sliphatic chemicals in 1927, and when we remember that the lacquer industry as we know it to-day did not exist in 1922, we are led to conclude that the increasing manufacture of aliphatic chemicals is due largely to the increasing use of nitrocellulose lacquers.

Along with increased production of sliphatic chemicals, as noted above, has come a corresponding decrease in the cost to the consumer of these compounds. The average price per pound of synthetic eliphatic chemicals declined from 33.5 cents in 1921 (the first year in which they were reported separately), to 13.0 cents in 1927. This decline in price is shown graphically in Figure 2. The price trend of three of the most important solvents used in lacquers is indicated by the data given in the following table for butyl acetate, ethyl acetate and cellosolve (monoethyl ether of ethylene glycol):

	1923	*1924*	*1925*	*1926*	*1927*
Butyl acetate.....	.43	.31	.27	.201	.21
Ethyl acetate.....	.11	.12	.11	.092	.11
Cellosolve.....	.....	.....	.45	.32	.21

Naturally, an industry of such proportions as the lacquer industry will cause the establishment of other lesser industries which depend upon it. Some of these tributary industries which depend for their existence partly or entirely upon the nitrocellulose lacquer industry, are those which are engaged in manufacturing such articles as plasticisers, pigments, synthetic resins, sand-paper and polishing materials, spraying equipment, fume recovery devices, and, of course, the various synthetic organic solvents.

In addition to the improvement in the durability and outward appearance of objects coated with nitrocellulose lacquers, there are also several features of interest to the manufacturers themselves. The nitrocellulose finishes dry much more rapidly and to a harder film than oleoresinous products, thus making for greater speed of production and consequently lower costs. This is, of course, of considerable importance, since less investment in plant and partially finished materials is necessary. Furthermore, nitrocellulose products are now being used successfully to finish articles which were not formerly finished at all, for various mechanical reasons.

However, it should not be assumed from all this that the nitrocellulose lacquer has replaced all other types of finishing materials because it is the ideal

substance. True it possesses many desirable properties not found in oleoresinous products, but it also has a few disadvantages. Chemists and engineers are constantly at work on problems relating to the improvement of the present lacquers and the discovery of new film forming substances that may be cheaper than nitrocellulose and, in addition, possess greater flexibility and adhesion. A large number of synthetic products, mostly resins, have been investigated for this use with varying degrees of success. These include the phenol-formaldehyde resins, urea-formaldehyde resins, glycol-phthalic anhydride resins and the polymerized vinyl compounds.

Vinyl Resins Developments

The vinyl resins are of particular interest because it seems through them an approach to the normal use of varnish or paint can be secured without the disadvantages applying to the oleoresinous coatings.

Lacquers dry entirely by the evaporation of their volatile or liquid constituents, on the other hand, paints and varnishes dry only partly by evaporation. In a large measure, the linseed oil or other liquid vehicle, polymerizes through the action of oxygen and so-called driers, forming a resin that contributes to the solid film eventually formed. By means of the vinyl resins an approach can be made to this type of drying and therefore more film forming constituents left on a surface than is possible with ordinary lacquers. For example, the film forming constituents or total solids in a lacquer rarely exceed 25 per cent. but in varnishes or paints, and now in vinyl resin lacquers, it is possible to reach a figure of 50 to 60 per cent. for the total solids.

Surface coating materials can be produced from the vinyl resins in such form that they are water-proof and remarkably resistant to alkali or acid. They can be produced in any color and preliminary tests show their stability to light and weathering to be at lease equal if not superior to that of nitrocellulose lacquers.

These resins can be molded with or without fillers in any color and seem to have many advantages in this direction also.

These few words about the vinyl compounds are merely intended as an indication of the manner in which hitherto unknown or unprocurable raw materials may become important in a short period of time and sometimes effect revolutionary developments in old and established industries.

Although the character of the products will undergo a steady evolution it appears likely that the lacquer industry is here to stay and will continue to increase in size and in economic importance. The lacquer products that are made ten years from now will no doubt be entirely different from those now available, but one thing is certain, and that is new developments in aliphatic synthetic chemistry will keep pace with this progress and it will do its share in improving the quality of the products and in making new products possible.

Science and Sales

Solid alkali metal salts of organic compounds are made by grinding the organic compound with sodium phenoxide, the phenol being extracted with ether or alcohol, with the result that sodium para-nitromercuriphenoxide, sodium cyanomercuriphenoxide and sodium nitrophenylstibinate are obtained from the free phenolic compounds and sodium phenoxide. United States Patent No. 1,685,191.

In making detonating caps and the like a portion of the fulminate of mercury or lead azide is replaced by the addition products obtained from more than three molecules of lead oxide in neutral lead salts of picric acid, trinitroresorcin, hexanitrodiphenylamin, trinitrobenzoic acid and nitranilic acid. German Patent No. 468,935.

Calcium cyanamide and calcium sulphide in the theoretical proportions are added slowly to five times their weight of water, and the solution is then treated with carbon dioxide until all the calcium is precipitated as carbonate, the final products after heating, filtering and evaporating being thiocarbamide. Swiss Patent No. 119,471.

Salt solutions, for example 40 to 50 per cent aqueous calcium chloride, are used for effecting separation of hydrocarbon oils which are obtained from mixtures with solid substances resulting from industrial processes in which carbonaceous materials are subjected to a heat treatment. British Patent No. 302,941.

A fatty acid, such as oleic acid, is saponified with the aid of an aqueous solution of ammonia and then the resulting substance is mixed with chlorinated hydrocarbons or free fatty acids and alcohol in order to obtain soap. British Patent No. 289,582.

Phenol-formaldehyde or phenol-furfuraldehyde resins are used for the glazing of artificial stone surfaces which are first treated with phosphoric or boric acid or with a solution of a heavy metal salt. Swiss Patent No. 121,764.

Viscose rayon of reduced luster is produced by treating the viscose before spinning with a mixture of mono-and dichlorobenzene. These products are incorporated with the viscose solution. British Patent No. 285,066.

Paper pulp is treated with ferric chloride to make it electropositive and mixed with emulsified bitumen, which bears a negative charge, to produce a water-proof paper board. United States Patent No. 1,691,752.

Water-free (acid) petroleum distillates are refined by the addition of solid copper chloride and the resulting reaction products are removed by means of bleaching earths. United States Patent No. 1,687,992.

Nitric acid or the oxides of nitrogen are employed for treating warm coal tar air being blown through the latter, in order to remove the free carbon. Danish Patent No. 35,094.

Zinc chloride with the addition of small amounts of hydrochloric acid is used as a condensing agent in the preparation of cellulose acetate. British Patent No. 293,724.

A plastic mass is made from dry cork meal which is suspended in an indifferent medium, such as chlorobenzene, and then esterified. British Patent No. 291,773.

Thickened lubricating oils are obtained by adding basic aluminum oleate to them. United States Patents Nos. 1,691,882 and 1,691,654.

INSTITUTES

What they Can and Cannot Do for the Chemical Industries

By Lewis H. Marks, Ph. D.
Executive Secretary, Industrial Alcohol Institute

THE modern industrial institute is the product of evolution within the business fraternity; resulting from sad experiences. It is designed to reconcile independent individualism, versus voluntary co-operation, versus government regulation. It is a medium in conformity with ideas of democracy, intended to insure equal opportunity, to maintain individual initiative; and to accord freedom from government control—by voluntary co-operative abstinence from any agreement or understanding intended to limit production, control prices, allot territories or customers.

Two new Institutes—devoted to Wood Chemicals and Solvents—are about to join their fellows who cherish the interests of Naval Stores, Superphosphates, Milk Sugar, Zinc, Chlorine, and Alcohol—and this summary of the legitimate activities and the reasonable benefits of this newest form of industrial association is worth careful reading by any group of chemical executives not already so organized.

The difference between the old type of trade associations and the modern institute lies not in name, but in the actual underlying spirit. The "institute" stands for complete co-operation, intensive research, open competition, based on knowledge of conditions, most of which is furnished by competitors, resulting in a more or less stabilized industry, earning a fair return on the capital invested.

To-day, the unorganized business group is the exception rather than the rule. In the summation, trade associations or institutes represent the actual commercial and industrial life of this nation. Business now has a composite voice to address government and the people. It participates in the councils of government or labor and invites the consumer to participate in constructive development.

The future, nevertheless, is obviously speculative, despite the fact that the business man appreciates what has been accomplished through the application of a few more or less scientific experiments to business and clearly sees that the trade institute is a medium for analysis and synthesis. A healthy sign of potential progress is the business man's recognition that, what he cannot do individually or collectively, because of the restraint of the law, is, in the light of history and experience, uneconomic. His problem, therefore, is not what he cannot do, but, in reality, what he can and should do to progress. The law forced him to abandon certain practices, and this brought about the discard of certain concepts. For example, he learned that high wages resulted in increased consumption, and that shorter hours, coupled with restricted immigration, ushered in the era of human and mechanical efficiency.

Expenditures for research in order to better production, to increase uses, and to improve marketing; expenditures for advertising, for the extension of credit to the masses, and for an infinite variety of technical and commercial studies, facilitated mass production, standardization, simplification, lowered costs; and these factors are, in turn, steadily removing the causes which formerly brought about recourse to limiting production, control of prices, concerted selling, and allotment systems.

Whereas, formerly, a producer feared the competition of those in his own industrial group, he now finds he must work constructively with his competitors to combat the menace of that group which is enticing the dollar which would normally be his. For example, the wood manufacturer must now contest with the brick, cement, steel and similar fabricators.

The means usually employed to achieve this end is co-operative advertising. This is surely one of the most important of all possible activities of a trade organization. Many producers in various lines, although very progressive business men, are too small individually to carry the story of their product and industry to the buying public. They can accomplish this in a more efficient manner by contributing their share toward the expense of a joint advertising campaign.

Market stabilization and decreased selling cost usually result from a properly conducted, co-operative advertising campaign, which results in increased profits—usually in direct proportion to the amount expended on the campaign. This profit differential is not derived from a penalty imposed on the consumer, as is frequently charged, but arises from the economies effected in sales and distribution cost; better control of inventories and less duplication of effort and expenditure on the part of the individuals who are properly co-operating. That industry which is doing nothing to-day in the way of preparing for to-morrow through advertising, may to-morrow be so submerged by competition, that it is no longer in a position to take the necessary curative steps.

Associations in Name Only

While forces are tending to foster the trade institute as the medium for individual as well as group preservation and expansion, there are too many associations which are that in name only, or are more representative of a fraternal body. They are operated on a minimum expenditure, are manned by a figure-head personnel; have no organized or modern projects, overlook research, and are composed of either a limited or disinterested membership. They have no liaison connections, are voiceless in the councils of industry, and are virtually unknown to the consumer, the government, and the public.

On the other hand, there are other associations so embrasive in character that they function on an elaborate basis, engage in many activities, but lack in intensiveness and specialization. For example, consider the association composed of allied groups of a particular industry, from the raw material miner or producer, through to the container manufacturer, the distributors, importers, exporters, advertising and shipping agencies. While such an association may serve useful purposes, it requires no profound thought to see the need for the establishment of more specific groups, not as sections of the whole, but as separate working entities, which might maintain a liaison membership for participation in the deliberations of the embrasive craft body.

Actually, this is the most recent development and this thought has led to the formation of many trade institutes, headed by capable executives, secretaries or general managers, with extensive knowledge of the industry and with ability to introduce modern associative practices. Every trade group that hopes to succeed must be guided by a man who is not only capable, but who is recompensed to a degree which justifies devoting all his time, thought and effort to the affairs of the group. We are in an age of specialization, and trade groups must be in harmony with this condition. It is a logical thought, for who, after all, can better diagnose our condition and prescribe therefor, than the specialist.

It would be fairly safe to say that practically every branch of business in the United States is, to some extent, organized. In this connection however, I fear that the bigger and better thought has, during the course of development, been accorded a false meaning. Collectivism has been stressed to the detriment of the selective, the extensive at the expense of the intensive; the welfare of the whole has over-shadowed the needs of the component parts. Try to visualize the results for a specific group, based upon the character and scope of industrial research, sponsored by the type of embrasive trade association I have outlined.

As an example, consider the value of a cost accounting system—an accurate cost accounting is fundamental to every other activity—emanating from such a body. How equitable would be the return from a concerted endeavor to stimulate demand? Commensurate results to all are not possible even in such presumably feasible activities as co-operative insurance arrangements, traffic bureaus, and representation in public matters.

The inequity among trade organizations is particularly apparent in the collection and dissemination of trade statistics, market interpretations, the interchange of patent rights, purchase agreements, standardization, simplification, and limitation of variety of products manufactured, or raw materials purchased.

The properly conducted open price association most decidedly could not be conducted other than on a specialized or institute basis. Such organizations are composed exclusively of specific group sellers, manufacturers, or jobbers. They are primarily concerned with the mechanism of price determination and frequently accord one another comprehensive, accurate and immediate information as to the market, based upon reports as to production, stocks, sales, and shipments of members, supplemented by general information. Furthermore, extensive and intensive basic studies are made from time to time as current and future market guides.

Advantages of the Open Price

From the foregoing, a similarity between the open price association and the exchange becomes apparent and is more evident than in any other form of association or combination, and yet, you will note the feature of difference—the absence of the buyer as a component. This is particularly so when all facts are made public; when all operations are conducted in strict adherence to law; when co-operation is accorded the government; and when a code of ethical and economic regulations are drawn up and adopted as the result of a trade practice conference, held under the guidance of Federal Trade Commission.

Where the feature of scientific, industrial and marketing research is involved, I believe that an open price institute is superior to the exchange, if for no other reason than by virtue of the specific community of interest involved, which may more readily profit thereby.

Now, let me place prominently before you the feature of research. This is a broad term, for it is as broad as the word, "science," with which it is involved. To state that research pays dividends is no longer a debatable statement. In the light of present day knowledge, we know that progress is predicated upon research and, conversely, that the industry that overlooks research is ultimately displaced. It takes a keen mind to map out a research program involving the discovery of the unknown, or intended to produce results in the field of production and distribution, and it requires courage to subsidize such a plan. Many business men go a certain distance, become discouraged, stop and find later that the man who carried on from the point where they left off received the accumulated dividends. We all realize that we must spend money to make money, but the wisest expenditure a man can make is to carry his share of the burden in co-operative research activities. Furthermore, the size of the burden should not be determined by individual generosity, but each and every one must bear his proportionate share of that which is requisite to carry through the work outlined by a capable executive, possessing broad vision.

The Institute's Advantages

A modern trade institute is the answer to the merger and the trust. Speaking in general terms, firms are forced by their undesirable financial situation to merge, or they do this because they fear the future. Through knowledge, conveyed through the open price institute, they are individually strengthened, or realizing weakness and lacking courage, are only too willing to terminate their activities. One of the remarkable things about a really worthwhile institute is the fact that the small man is not only the equal of the largest—he is usually the more prominent. This may be readily appreciated when we consider that the little fellow can usually answer "yes" or "no", advise constructively or criticize without having to obtain the sanction of a Board of Directors. Furthermore, the representative of a large corporation under such circumstances might possibly give the impression that he was attempting to dominate by virtue of the prominence of his connection. Finally, the little man has usually more time and can take a more active part in the mechanics of the operation of an institute. So in addition to the trade institute being a stabilizing and expanding factor, it is likewise a levelling factor so far as its membership is concerned, as it paves the way for the display of that individuality which we so proudly cherish. As time elapses and our activity quickens, business men will find that the more they do for their trade organization as individuals, the more the organization will do for them.

Co-operation — well-directed, collective effort — affords the opportunity to make an industry, and ultimately the individual, paramount.

The Industry's Bookshelf

The American Chemical Industry. Production and Foreign Trade in First Quarter of Twentieth Century, 114 pages, Superintendent of Documents, Government Printing Office, Washington, D. C., $.20 net.

A valuable correlation of statistics on production and foreign trade in chemicals during the first quarter of the present century. Copies may be procured from any district office of the Bureau of Foreign and Domestic Commerce, as well as from the above address.

A Survey of Nitrocellulose Lacquer, by Bruce K. Brown and Francis M. Crawford, 368 pages, The Chemical Catalog Co., New York, $7.50 net.

This survey includes solvents and diluents, patent abstracts, a bibliography of nitrocellulose literature, index of materials named in patents cited, and index of authors of patents and literature cited.

Annual Survey of American Chemistry, by National Research Council, 395 pages, Chemical Catalog Co., New York, $3.00 net.

The third appearance of this interesting compilation prepared under the auspices of the Division of Chemistry and Chemical Technology of the National Research Council.

A Laboratory Manual of Physiological Chemistry, by D. Wright Wilson, 271 pages, The Williams & Wilkins Co., Baltimore, Md., $3.50 net.

A revision of a previous work by Professor Jones and the present author which is exactly what the title describes—a guide for experimenting in the chemistry of the body.

Theoretical Mechanics, by Joseph Sweetman Ames and Francis D. Murnaghan, 462 pages, Ginn & Co., Boston, Mass. $5.00 net.

Theoretical mechanics brought up to date in the form of reference book for students of physics, mathematics and chemistry, serving as an introduction to mathematical physics.

Chemical Reactions and their Equations, by Ingo Waldemar Dagobert Hackh, 145 pages, P. Blackinston's Son & Co., Philadelphia, Pa., $2.00 net.

This is the second edition of this handbook to aid students in overcoming an inability to balance chemical equations.

Chemistry of Pulp and Paper Making, by Edwin Sutermeister, 565 pages, John Wiley & Sons, New York, $6.50 net.

This is the second edition of this volume which first appeared in 1920, and revises and brings up to date the various chemical aspects of the pulp and paper industry.

The New Industrial Revolution and Wages, by W. Jett Lauck, 308 pages, Funk & Wagnalls Co., New York, $2.50 net.

A study of the radical changes in theory and practise of industrial America which have come into being since the war.

Biology Experiment Sheets, by Shelley R. Safir, PH.D., Globe Book Co., New York, $.75 net.

A carefully prepared series of experiments for the student of elementary biology.

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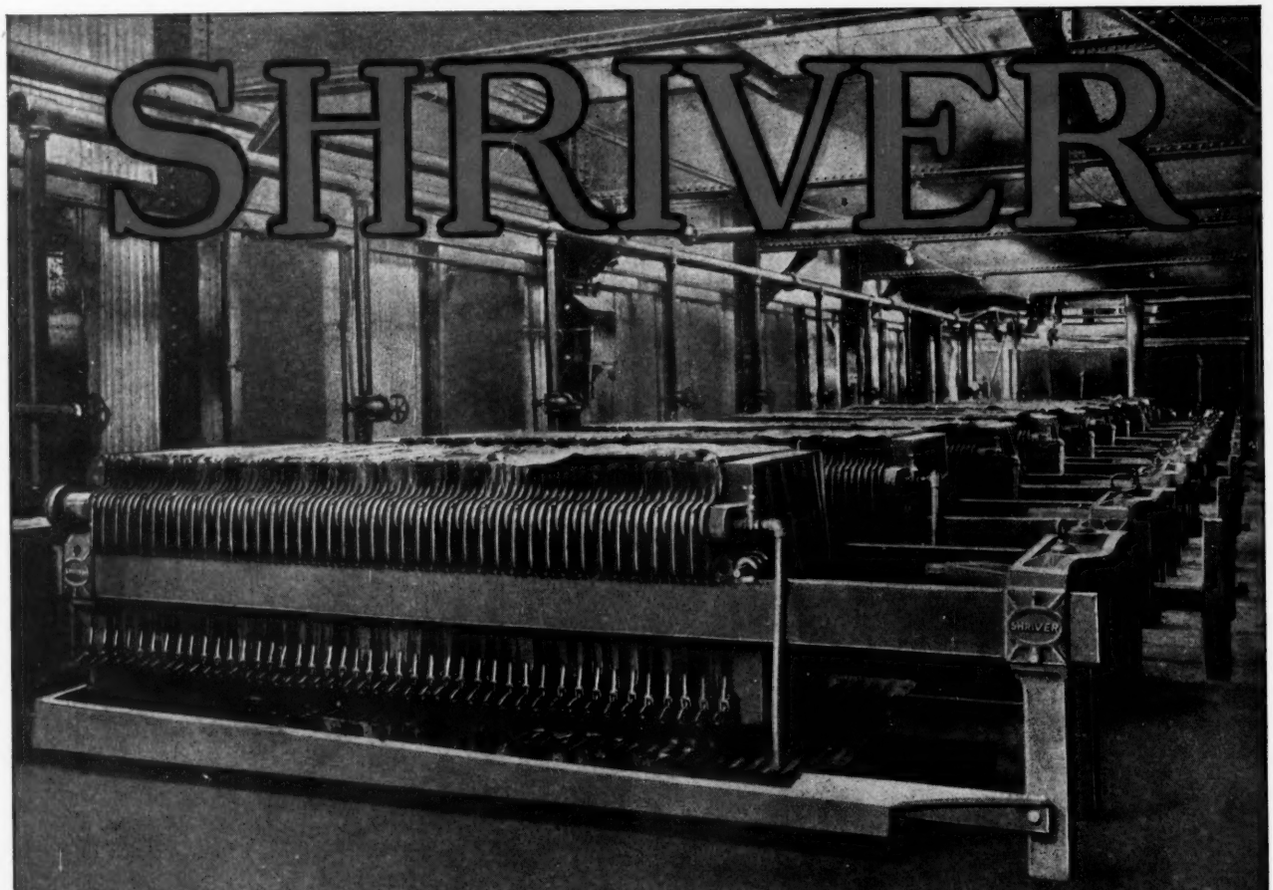

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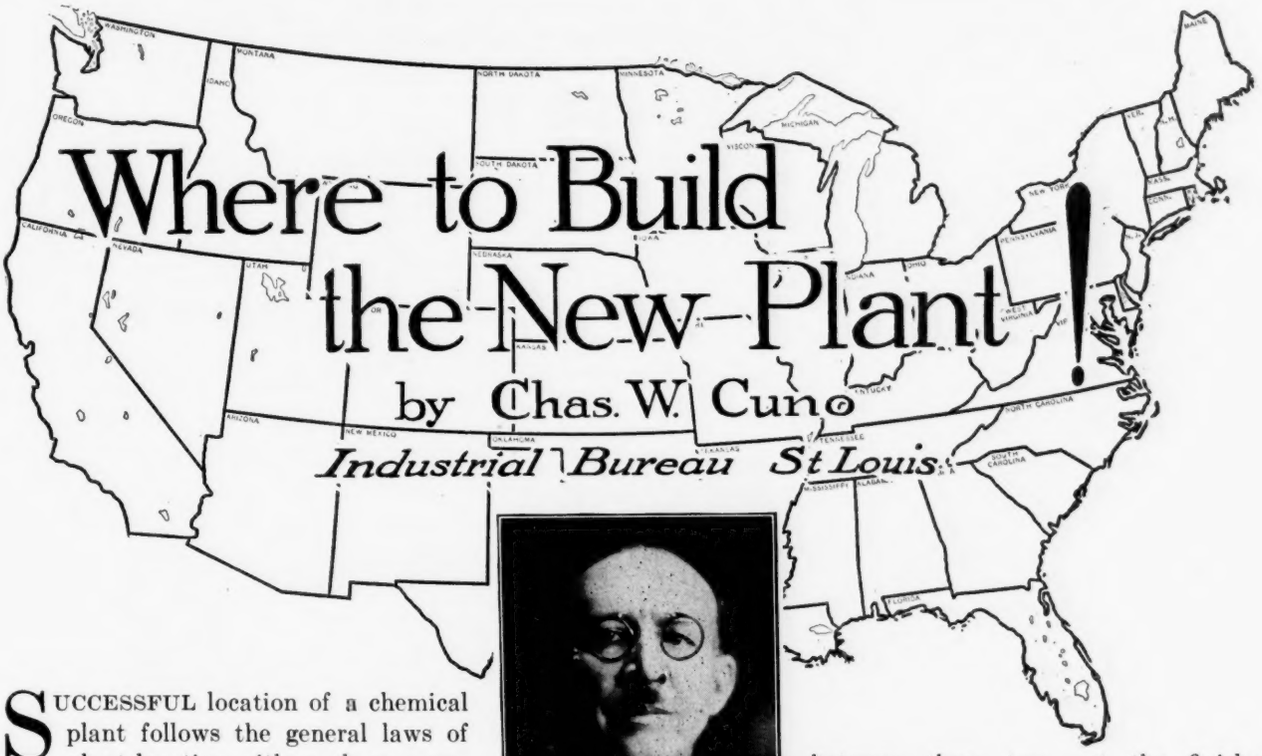

Where to Build the New Plant!

by Chas. W. Cuno

Industrial Bureau St Louis

SUCCESSFUL location of a chemical plant follows the general laws of plant location with, perhaps, special emphasis on consideration of the feeder, competitive, and consumer industries. One of the first facts that economists discovered was that industries have a tendency to centralize. A further fact which is just beginning to dawn upon the minds of our economists is this: that industries also migrate. These tendencies—the centralization of industry and the migration of industry—are governed by definite factors of plant location.

Successful plant management resolves itself into two parts: first, that of economic production and, second, that of economic distribution. Too often those concerned in economic plant location look only upon the five factors of production, raw material sources, labor, fuel, power, and water resources. Too frequently they neglect the sometimes more important factors which affect overhead and distribution and which may be grouped under the headings of transportation facilities, freight rates, magnitude of markets, climate, taxes, corporation fees, municipal restrictions, and competitive, feeder, and consumer industries.

I have in mind a silica brick company which located its plant ideally for production. On one side was a towering bank of silica sand which could almost be shovelled directly into the plant. A few hundred yards away a limestone ledge supplied raw material directly to the lime kilns. A modern plant erected between these two put the finished product on board the cars at minimum cost. But several factors of plant location had been neglected. First of all, labor had to be paid from 50c to 75c more per day than in the neighboring city. This city was the chief and, in fact, sole market, and a rival silica brick plant was located there. But the higher cost of labor was a minor item compared with freight rates. The rival plant in the city could obtain silica and limestone, the chief raw materials under a freight rate of 50c per ton, whereas the finished product of this company, silica brick, took a freight rate from the plant to the city of $4 per thousand, a burden over and above the freight rate on raw materials of nearly $3 per ton. In this case the freight rate situation was clearly the governing factor in plant location.

The Power Factor

Considering the factors of plant location which concern themselves with production, the lodestone of basic industries, whose major raw materials are unprocessed, has usually been cheap fuel or cheap power. We find, therefore, that electro-chemical industries, such as those that manufacture alkalies, chlorine, carborundum, graphite, abrasives, electrolytic metals, etc., centralize about cheap sources of hydro-electric power.

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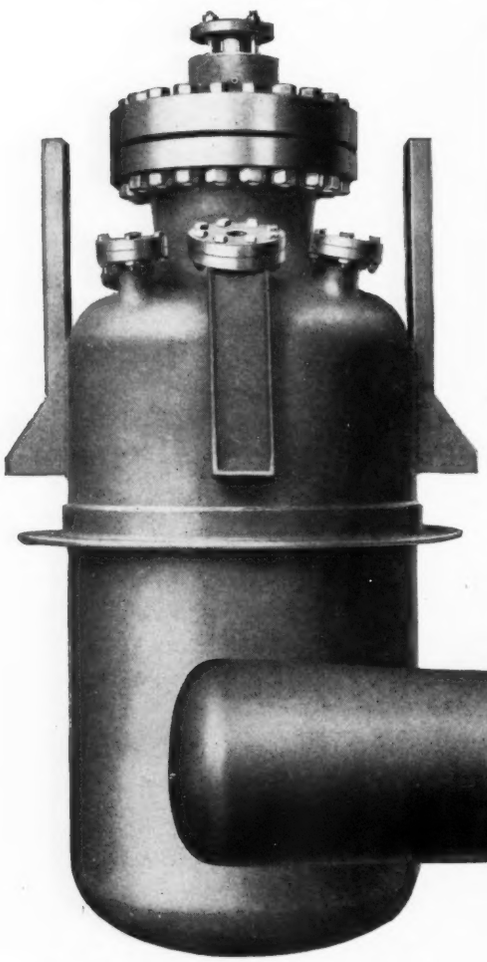

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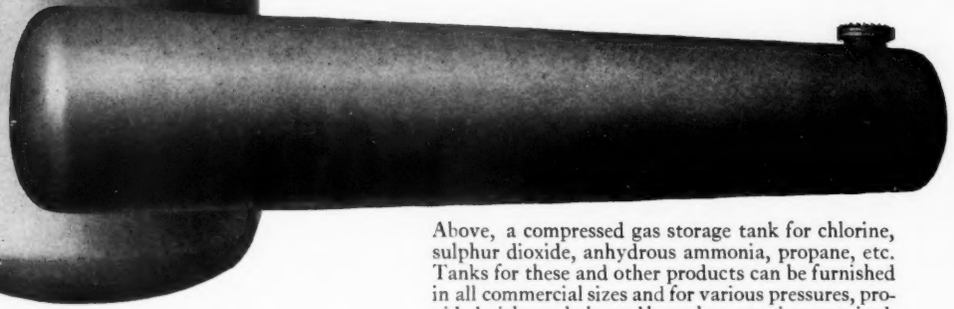

Above, a compressed gas storage tank for chlorine, sulphur dioxide, anhydrous ammonia, propane, etc. Tanks for these and other products can be furnished in all commercial sizes and for various pressures, provided with manholes and branch connections required.

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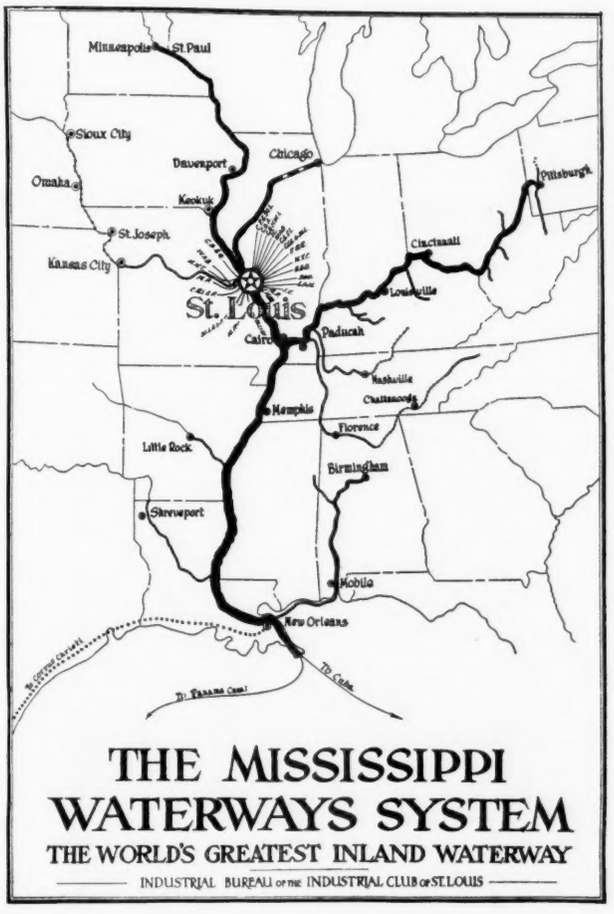
It is to be remembered, however, that coal, gas, electric power, and raw materials are the most cheaply transported commodities. We find, therefore, that there is often a compromise between sources of raw materials and sources of fuel, as is evidenced in the iron and steel industries. The most prosperous of these are located in the Chicago, Cleveland, and Detroit districts, where evidently a compromise has been made between the haulage of iron ores from the Wisconsin and Michigan and coal from Pennsylvania and Virginia. This compromise has been made at points of high local consumption and exceptional distributing facilities.

In the examination of intermediate industries whose major raw materials are the semi-finished products obtained from basic industries, we find the trend of migration towards locations where those semi-finished products are obtainable. Examples of such industries are steel mills and steel fabrication plants which depend upon blast furnaces for their pig iron; the manufacturers of intermediates who depend upon by-product coke ovens for their tar; dye manufacturers



Transportation facilities is an important factor of chemical plant location and maps such as this furnish valuable aids in surveying cities for location.

who look to the producers of intermediates for their raw materials, etc. It is evident that such semi-finished products must take a higher freight rate; therefore, such industries look not so much to cheap sources of fuel or power as to advantageous connections with producers of certain finished products and to adequate outlets for their finished materials. In this case it is clearly seen that feeder, competitive, and consumer industries are prominent factors in determining the location of these intermediate industries.

We have observed the migration of cotton mills and rayon factories to the southern states. Cotton is the semi-finished product for the cotton mills, and cotton linters and wood pulp for the rayon factories. But the factor which has influenced this migration is not these sources of semi-finished products, but the supply of the cheap labor in the South. The wisdom or fallacy of location on such a basis is not a matter for discussion in this paper.

Raw Material Influences

Among the five factors of plant location that concern themselves with production, raw material sources may be considered as local, favorable, or competitive and are tributary to certain communities because of quality, reserve, proximity, and sources of competitive materials. Raw materials have really no geographical limitation, but are tributary to a certain district where economic conditions, such as initial cost and freight rates, are more favorable than in other points of similar manufacture. Thus, bauxite from British Guiana is a raw material tributary to aluminum manufacture in the St. Louis district; Georgia talc is raw material tributary to the paper mills in New England and the Ohio Valley. Raw sugars are raw materials for the manufacture of refined sugar to all the coast sugar refineries and with proper barge rates would become raw material sources for a sugar refinery located at any inland port on the Mississippi River.

Labor is usually considered from the standpoint of its supply and cost, but labor involves such factors as kind, nationality, quantity, diversity, intelligence, existing wage scales, and efficiency. In general wages are lower in the country than in large cities. At present wages are lower in the Southern states than in the North Atlantic and the Mississippi Valley states. On the other hand, in quantity, diversity, intelligence and efficiency, the labor in the cities will be found better than in the country. Labor of certain nationalities is more dependable, intelligent and efficient.

Fuels—their sources, kinds, thermal efficiency, reserve, etc.—are important factors of plant location. The kinds of fuel are coal, coke, oil, and gas. Certain of these are more flexible than others. When they are in competition with each other, lower prices with higher thermal efficiency is the usual result.

Alternate Sources of Power

Power may usually be classed as hydro-electric or steam generated power. For large users of power, alternate sources are too often neglected. It is all very well to tie up to a single source of hydro-electric power in the hope that for the life of the industry no failures may occur or no raise in rates prevail. There

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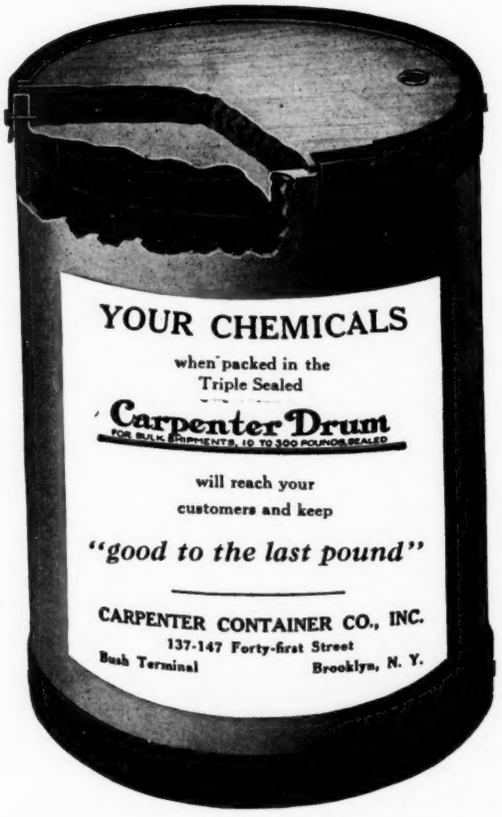


is, nevertheless, an historical background which cannot be overlooked: first, that hydro-electric power rates have been slowly increasing; second, that the costs of new installations are becoming more and more prohibitive. To this should be coupled the added fact that the cost of powdered coal generated power has been steadily decreasing in the past two decades.

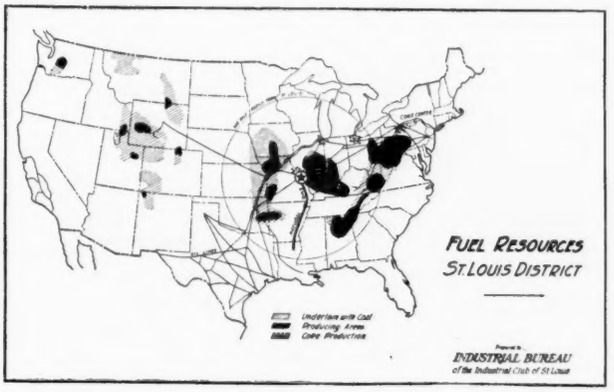
Another very important factor of chemical production is water,—its source, mineral analysis, bacterial content, turbidity, quantity, and cost. To more than 75 per cent. of the basic industries and 80 per cent. of the interemediate industries, water is one of the governing factors in plant location.

Of the factors of plant location that chiefly affect distribution and overhead, the most important, of course, are transportation facilities, freight rates, and markets.

Importance of Transportation Facilities

Transportation facilities, such as railroads, steamship lines, barge lines, terminals, and wharves, are the ways through which production flows to the consuming public. Where a city has more than one railroad or, better still, railroads and barge or steamship lines, the freight competition occasioned by these several transportation facilities makes for lower freight rates, efficiency, and service.

The territory in which favorable freight rates apply, as compared to other competitive points, is an important consideration in plant location. The larger the population reached in this territory, the more important such a district becomes as an industrial center.



This map showing the fuel and power resources of St. Louis is typical of the survey which might be made for any location.

Markets are defined as local, favorable, competitive, and national. The local area is the population served by reason of plant location. The favorable area is that which an industry can serve by reason of lower cost production or freight rates. The competitive area is where the industry must compete on equal, or nearly equal, terms with like industries in other localities. In the national area the industry must be able to overcome freight rates completely as a limiting sales factor.

Three factors, climate, taxes and corporation fees, and municipal restrictions, affect both production and distribution. The seasonal range, precipitation, humidity, wind, etc., which go to make the climate of a certain district, are factors that often enter directly into manufacture. Taxes and corporation fees are factors that increase or decrease overhead. High tax rates and high corporation fees often put industries out of certain states. Municipal restrictions are important factors in proper plant location. Many times industries find to their sorrow, after the expenditure of millions of dollars, that production is handicapped through the fact that certain municipal restrictions have not been considered. These restrictions may prohibit the use of certain materials or make an expensive outlay necessary to take care of certain obnoxious waste products.

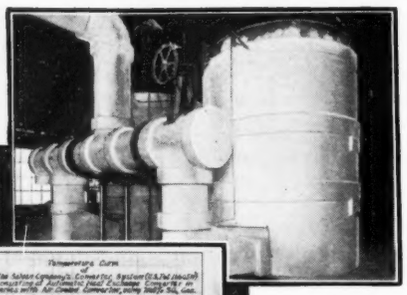
Industrial Backgrounds

There still remain three important factors of plant location: competitive, feeder, and consumer industries. For location in a proposed district it is important, on one hand, to know what competition the industry will have in its own territory. It is equally important to know the feeder and consumer industries at hand, the first to supply the needed raw materials and the second to supply an outlet for its finished product. In an analysis of industries we find that the order of importance of these factors enumerated is often changed, so that in one case one factor may predominate, in another, another. It is to be noted, however, that fuel, power, and raw materials are being transported longer distances to plants satisfactorily located for distribution; that distribution, favorable freight rates, magnitude of markets, and labor conditions are important factors in the location of all industries; that basic industries, generally speaking, seek cheap fuel or power; that intermediate industries seek favorable location to sources of semi-finished products; and that the factors of competitive, feeder, and consumer industries are often of importance in plant location.

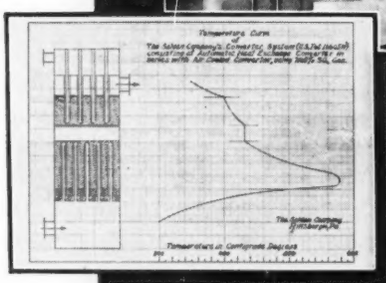
Competitive, Feeder and Consuming Industries

In applying these several factors to the location of chemical industry, we find, as I have stated before, that the factors of competitive, feeder, and consumer industries bulk large among the others. The reason for this is that the products of chemical industries usually take much higher freight rates than the raw materials used in their manufacture. A notable exception, of course, is the alkali industry, where caustic soda ash take little more freight, if any, than salt, the raw material from which they are manufactured. On the other hand, the manufacturer of sulfuric acid can usually command little more than

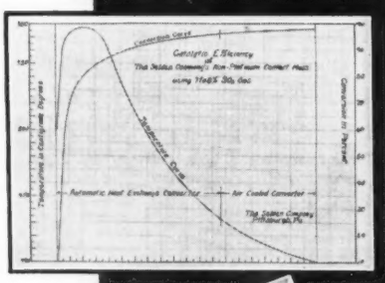
THE SELDEN COMPANY'S NEW CONTACT SULPHURIC ACID PROCESS CUTS PRODUCTION COSTS *not cents but* DOLLARS PER TON



The Selden Company's 40 ton Converters.



Temperature Curve of The Selden Company's Compound Heat Exchange Converter System. [U. S. Pat., 1,660,511]



Catalytic Efficiency of The Selden Company's Non-Platinum Contact Mass using 7 to 8% SO_2 Gas.

For the first time in Sulphuric Acid History, the production of contact acid has been placed upon an automatically controlled basis, making it possible to operate an entire plant from a single control point. Hitherto existing limitations of converter size and capacity have been eliminated and a new standard of conversion efficiency [98% or better] established.

This revolutionary development, unquestionably the most important contribution to the art in a quarter century, makes available tremendous economies in operation, so sensational, in fact, that no producer of sulphuric acid can afford to ignore their significance.

The Selden Company's New Compound Heat Exchange Converter System and New Non-Platinum Catalyst [stabilized for long life] are responsible for these extraordinary results. The charts at the left indicate how perfectly the automatic co-ordination of reaction speed and best possible equilibrium of the reaction is carried on throughout the entire converter system.

The Chemical Construction Company have already placed in operation and have under construction plants using this new process having an annual capacity of 400,000 tons H_2SO_4 equivalent.

Present contact plants can be changed over with no cash outlay as the salvage on the platinum catalyst will cover the cost of transformation. Investigate now. Write for descriptive booklet, today.

The New **SELDEN** *Process*

The New Selden Compound Automatic Heat Exchange Converter System

The New Selden Non-Platinum Catalyst-Stabilized for Long Life

CUTS H_2SO_4 Production **COSTS** Dollars Per Ton

The SELDEN COMPANY

B-594 Selden Chemical Square
Pittsburgh, Penn., U. S. A.

the local market, and the measure of his production is local consumption. For intermediate chemical industries, for the same reason, it is almost imperative to locate near local sources of semi-finished products. It would seem, therefore, that for basic chemical industries and also for those intermediate industries for which chemicals are major raw materials, the most logical plant location would be at a point of exceptional distribution facilities,—where the local market is large and the favorable and competitive markets show a goodly number of feeder and consumer industries, with not too many competitors doing business in the same territory.

In basic chemical industries, the tendency is to ship raw materials farther and finished products less. In intermediate industries, the tendency is to group around basic manufacture, when such basic manufacture is strategically located for distribution.

New Incorporations

Logan Laboratories, chemicals—J. M. Hanely, 63 Wall St.—50,000 shs.

Artsel Chemical Corp.—C. S. Rosenthal, 1,440 Broadway—10,000 shs.

Portsmouth Cotton Oil Sales Co.—Horowitz, Rosston & Hort, 141 Broadway—200 shs com.

Northeast Louisiana Gin Co., Inc., New York, cotton seed, cotton seed products—Orem T. Wharton, Dover, Del.—100,000 shs.

Alabama Chemical Securities Co., Wilmington, stocks, bonds,—Corporation Trust Co. of America, Wilmington—100 shs com.

National Synthetic Corp., Wilmington, chemicals, minerals—Corp. Trust Co. of America—10,000 shs com.

S. H. Chemical Products Co.—L. Tittelbaum, 16 Court St.—10,000 shs.

Neuberger Chemical Corp., New York City, cement, lime, concrete,—Corporation Trust Co., of America, Wilmington—$90,000, 100,000 shs com.

Chemical Ingredients Corp., Jersey City, manufacture chemicals—Samuel S. Stern, Jersey City—10,000 shs.

Merit Trading Co., chemicals—H. I. Trachman, 120 Broadway 100 shs com.

American Huettenes Corp., chemicals—M. J. Solomon, 26 Court Street—$10,000.

The Bramberg Corp., Newark—paints—Louis B. Englander, Newark—$125,000.

Associated Products, Inc., Wilmington, Del.—retail drugs, dye stuffs—Corporation Service Co., $1,000,000, 100,000 shs com.

Rockwell Chemical Corp. Wilmington, Del., Delaware Registration Trust Co.—$500,000.

Flora Aromatics Co., chemicals—H. Escher, 14 Wall St.—$25,000.

The Carlton Co., Paterson, chemicals—Frank J. Davies, Paterson—125,000 pf, 16,000 shs com.

Chemicolloid Corp. of America, machines—Eisman, Lee, Corn & Lewine 271 Madison Ave.—31,000 shs com.

Il-No-Mor Laboratories, Inc., Brooklyn, N. Y., chemical analysis—Delaware Registration Co.—$100,000, 2,000 shs com.

The Darling Specialty Co., Wilmington, Del. cleansing and polishing preparations—Horace Greely Eastburn, Wilmington, Del.—1,000 shs com.

Riedel-S. E. Haen, food products—H. Hoelljes, 95 Madison Ave.—$100,000.

Chemed Laboratories, chemicals—N. Siegel, Jr., 250 West 57th St., Manhattan—100 shs com.

Peat contains about 0.85 per cent. of a white wax melting at 169 degrees F. in the crude state, and at 175 degrees F. when purified by recrystallization from petroleum ether, according to the Department of Commerce as a result of experiments to determine the amount and character of wax extractable from Wisconsin peat by means of hot alcohol. This wax consists mainly of esters and is apparently similar to that from Irish peat.

Classification of acetate artificial silk yarn under paragraph 31 of the Tariff Act of 1922, which means that the merchandise will be assessed at a higher rate of duty than heretofore, is ordered by the Bureau of Customs. The new rate, which will become effective 30 days after official publication by the Treasury, will be 60 per cent. ad valorem whereas the rate at present in effect is 45 per cent.

Australia's sulfur imports, which amounted to 91,781 tons in 1926 and 95,834 tons in 1927, came chiefly from the United States which supplied 95 and 99 per cent. respectively.

Geigy Co., New York, dyestuffs, plans new factory branch and distributing plant at Charlotte, N. C.

New Plant Construction

Pyrites Co., Ltd., files plans for two new additions to Wilmington plant, consisting of a one-story unit to be used for production of Glauber salts and a two-story structure to be equipped as a solution reduction unit. Expansion will cost about $65,000 including machinery.

American Cyanamid Co. plans erection of power plants on the Holston River in Tennessee. Approximately $35,000,000 will be spent to develop plants and factories at that site for production of ayanamid and other products.

McGean Chemical Co., Cleveland, plans erection of plant, consisting of six buildings, one- and two-story, reported to cost about $125,000 with equipment. Production will consist of chemicals and colors for the ceramic and allied industries.

Naugatuck Chemical Co., Naugatuck, Conn., plans new factory unit at Waterbury, to be four-story, reported to cost about $100,000 including equipment.

Skenandoa Raton Corp., Utica, plans erection of four new plant units to cost about $3,000,000 as part of a general expansion program.

W. B. Norris Fertilizer Co., Rushville, Ind., plans rebuilding of portion of plant destroyed by fire with estimated loss of $50,000, including equipment.

Stauffer Chemical Co. plans construction of $1,000,000 sulfuric acid plant at Hammond, Ind., on a tract of ground already held by the company.

Newport Chemical Works, Passaic, plans construction of addition to plant to be three-story and cost about $40,000 with equipment.

Linde Air Products Co., New York, announces beginning of operations in three new plants, at Jacksonville, Fla.; Louisville, Ky.; and Oklahoma City.

Stuebing Cowan Co., Cincinnati, is constructing a new $200,000 plant at that point which will be devoted to the manufacture of lift trucks and platforms.

Selden Co., Pittsburgh, plans construction of new plant unit at Bridgeville, to be one-story and cost approximately $45,000.

Cummer Products Co., Cleveland, dyes, polishes, specialties, plans new plant to cost about $50,000 with equipment.

Dunlap Chemical Co., Memphis, plans construction of new plant at Jackson, Miss., to cost about $45,000 with equipment.

Pfaudler Co., Rochester, plans construction of two-story plant addition to cost about $55,000 including equipment.

F. S. Royster Guano Co., Norfolk, acquires site and plans erection of fertilizer plant at Jackson, Miss.

Republic Creosoting Co., Indianapolis, plans two-story laboratory to cost approximately $100,000 with equipment.

Mutual Chemical Co. is erecting a one-story addition to its Baltimore plant.

Tennessee Eastman Co., Kingsport, Tenn., plans construction of a $2,000,000 cellulose plant at that place.

Look for the mark of Swann Products

IN YEARS past when barter represented a method of exchange of commodities, personal inspection was possible. Today, with industry so vast the mind can scarce conceive its immensity, Faith is the buyer's only safeguard. The mark of Swann Products is a mark of faith — an identifying mark of maintained quality. Plant executives may place Complete Confidence in products bearing this mark of value.

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Acid Sodium Phosphate, Pyro
Mono Ammonium Phosphate
Di Ammonium Phosphate
Di Calcium Phosphate
Tri Calcium Phosphate
Phosphoric Acid Paste

Diphenyl

Textile Oils and Chemicals

Federal Abrasives Co.
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Southern Manganese Corp.
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Mono Calcium Phosphate (H. T. Phosphate)
Phosphoric Acid
Acid Calcium Phosphate
Pyro Calcium Phosphate
Di Calcium Phosphate
Tri Calcium Phosphate
Pyro Sodium Phosphate
Tri Sodium Phosphate
Crystalline Phosphate, etc.
Calcium Sulphate
Bicarbonate of Soda
Sodium Aluminum Sulphate
Laundry Soap Builders

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Factors in Applying

SPRAY DRYING

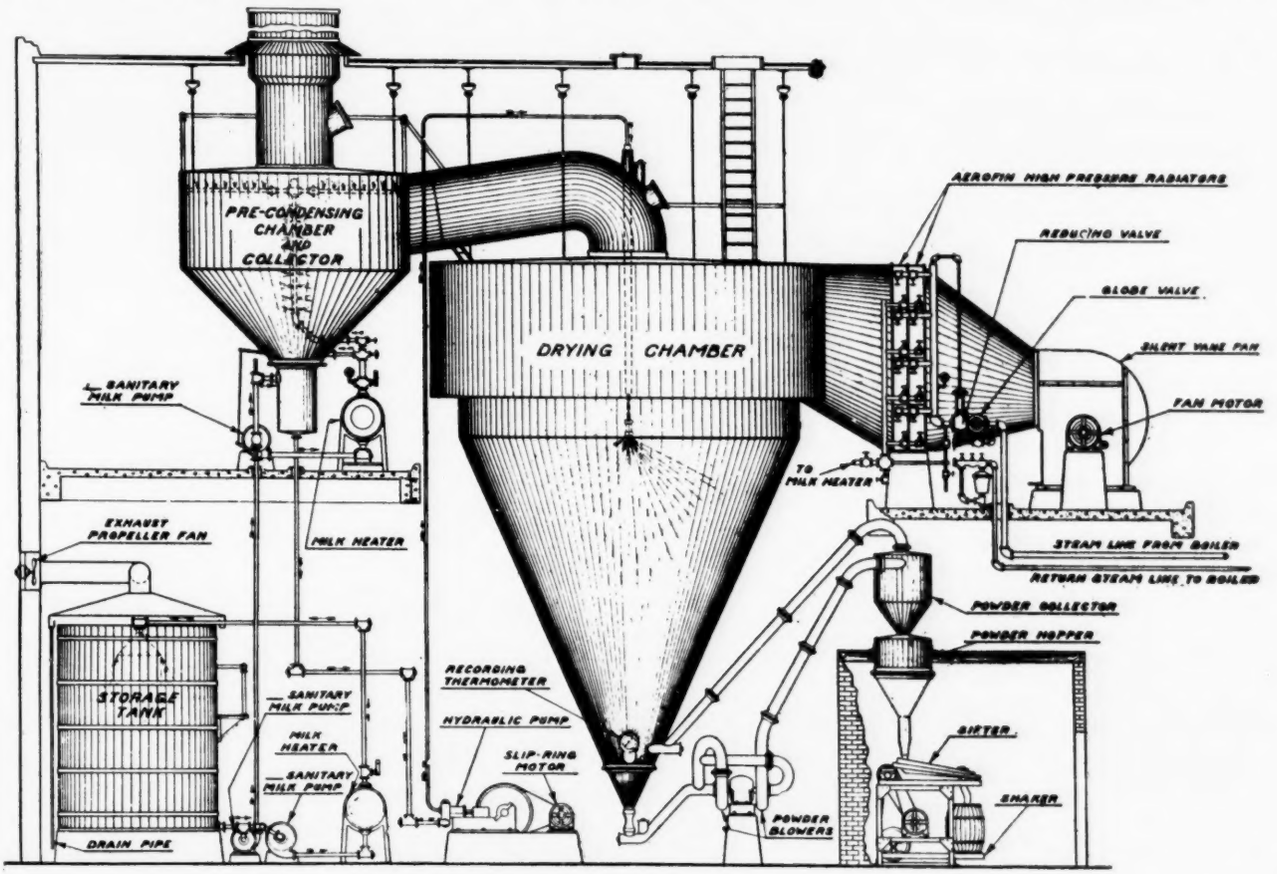
to Chemical Production

By A. W. Farrall

Douthitt Engineering Company

THE chemical industry is to-day confronted with an ever increasing demand for more efficient methods of handling its process work. One of the problems frequently met with is that of removal of moisture from a fluid containing solid matter in solution or suspension. There are many ways of removing moisture, such as by natural evaporation at atmospheric temperature in open vessels, or by heating under reduced pressure as in a vacuum pan, or third, by means of a system in which the liquid to be dessicated is sprayed into a chamber containing heated air. This latter is termed the spray method and a dryer operating on this principle is called a spray dryer. The principal feature is a very rapid and efficient evaporation in properly constructed equipment, due to the extremely large surface area of the liquid spray which is exposed to the heated air. Many different types of equipment have been built to utilize the above principles.

Spray drying has a number of features which recommend it for certain drying problems. Among these are the fact that the powder comes from the drier in a fine state and needs no further grinding; the heat efficiency is high; the depreciation is low, due to the fact that heat transfer is directly from the hot air to the product, no metal surface being involved; cleaning is easily accomplished; accurate control of temperature is possible; wide variation of temperature is possible; short exposure of the product to heat results in a higher quality product than with most other processes, and in fact makes possible the successful drying of some products not otherwise possible; the product is very thoroughly dried, leaving less than one per cent moisture if desired; powder can be



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The new lacquer constituent with high ultra-violet resistance

A SERIES of synthetic resins providing enormously increased durability to nitrocellulose lacquers and each being a true solvent for nitrocellulose. Each Rezyl has individual outstanding characteristics and special applications. They impart many times the durability otherwise obtainable and provide partial replacement for nitrocellulose requirements.

REZYL No. 12 is recommended as a product for general application in nitrocellulose lacquers.

REZYL BALSAM No. 33 was developed as a plasticizer to accompany the Rezyls, imparting equal durability.

TEGLAC No. 15 is a lower priced product for indoor work where durability is less a factor.

Standard Packages—320# drums—50# pails

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Ethyl Lactate is the ideal high-boiling solvent for use with Rezyls

Used with Rezyls, Ethyl Lactate permits a higher solid content without objectionable viscosity.

Technical specifications and recommended practices for lacquers and similar coatings for wood, metal, paper, textiles, leather, etc., for inside or outside service will be sent upon request.

Use the coupon for samples of Rezyl No. 12, Rezyl Balsam No. 33 and Teglac No. 15.

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Please send technical specifications and samples of Rezyls. I want them for use in the following type lacquers:

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☐ Automotive ☐ Wood
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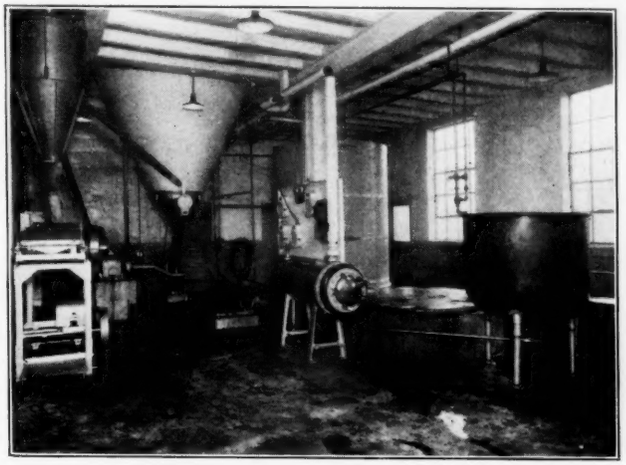
removed immediately and continuously, thus retaining its high quality; and labor costs are low, as one man can easily look after the plant and take care of the powder at the same time.

A typical spray drying system is shown in the accompanying diagram. This is using a hook-up which has been found very successful in the drying of milk, blood, and various chemicals. There are three main parts: first, the heating chamber where the air or other gas used for drying is heated to the proper temperature; second, the drying chamber proper in which the final moisture is removed from the liquid and the powder is separated from the vapors, third, the "collector" or economizer, which serves as a precondensing chamber for the liquid and makes use of the waste heat in the spent heated air that is exhausted from the stack.

During operation, air or other gas is heated by steam coils or direct firing, is passed into the drying chamber through tangentially located slots from the wind box and whirls about inside the chamber, where it comes in contact with a fine spray of concentrated liquid which is forced into the chamber, by a suitable atomizer. The action of the whirling air is such that it strikes the driest particles first and the moist spray last, thus by means of a counter flow principle, it makes an ideal drying situation. The powder formed by removal of moisture is thrown downward and outward settling to the bottom of the cone. It is then removed and cooled continuously by means of a pneumatic conveyor which also deposits it in a powder collector.

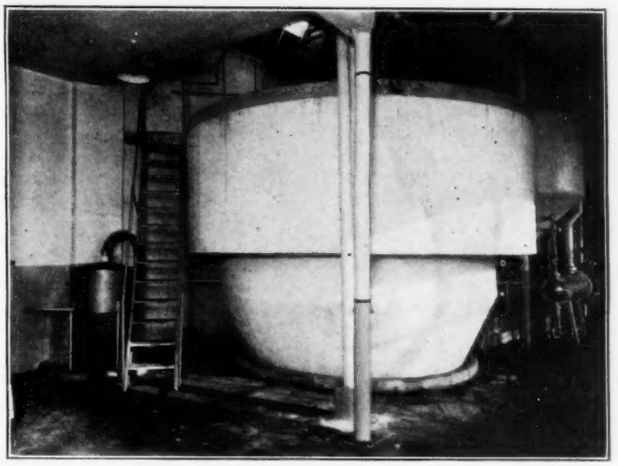
The moisture bearing air is taken out of the center of the top of the drying chamber and is led to the



Lower part of the spray drying chamber showing from left to right—powder sifter and powder hopper, pneumatic conveying system, drying chamber, liquid heater and storage tanks for liquid.

collector, where it is made to enter tangentially and is given a whirling motion. Here it comes in contact with a liquid spray of much coarser nature than the first but which serves to reclaim any fine powder which would otherwise be carried out at the stack. This spray also absorbes a great portion of the heat remaining in the air from the drying chamber. Air leaves the stack at a low temperature and practically saturated with moisture.

From the above description, it is evident that a very rapid and efficient drying action takes place, that it is possible with spray drying to remove moisture so rapidly from a liquid, that the product even though quite sensitive to heat can be dried readily without injury.



Upper part of a spray drying chamber showing pre-condensing chamber and collector.

The spray drying system has been successfully used for drying a considerable number of chemicals, both in an experimental way and in practical operation.

Numerous inorganic solutions such as phosphates, sulfates, and carbonates are readily dessicated by the spray process, and the capacities are very high.

Sugars are quite difficult to dry alone, but in combination with colloidal material are quite readily dried. Black strap molasses and glucose are products containing considerable quantities of sugar, yet which can be quite readily dried.

The above mentioned products show only a few of the possibilities of spray drying, and nothing has been said about the exact treatment necessary in each case. In general, however, any liquid product which has solids in solution or in fine suspension can probably be spray dried successfully. Each product has certain peculiarities and requires careful consideration of its individual merits. Thus in some products, temperatures are very important, in others, the type of nozzle is important. Liquids of high viscosity and low solids are difficult to handle and show low yields. The process offers the greatest possibilities in drying food products where accurate temperature control and high quality of product is very important. It is also valuable in drying fruits and vegetable juices. Many have found it highly desirable for making intimate mixtures of compounds, mixing the products in liquid form and drying the mixture.

Selection of a spray drier involves a careful study of conditions to be met and type of product desired. Guess work is unnecessary in solving spray drying problems for several leading companies now have

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TRI-SODIUM PHOSPHATE

CALCIUM CHLORIDE

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complete experimental laboratories where it is possible to work out a drying problem in its entirety from the first preliminary experiments which point the way, to a complete production run covering several days, under commercial operating conditions; costs of operation can be accurately determined, as can also effect of various factors on quality.

Some of the points that need consideration in determining upon a spray drying plant are as follows: first—is a satisfactory product produced; second—is the capacity sufficient to care for present and future needs; third—is the cost of operation such that it will allow a reasonable profit; fourth—is the method of heating the most efficient. (Steam heat is desirable for some work, while direct fired oil or gas heaters are best and most economical for others); fifth—is the plant constructed of metals which will last under the action of the fluids which come in contact with it; sixth—is the plant proven by successful installations in daily operation; and seventh—is the company which sells the plant, interested in seeing that the owner gets the service he is entitled to expect.

Manufacturers' Publications

International Combustion Engineering Corp. announces publication of the July number of "Combustion," the first issue of a new monthly magazine published by the company.

Frank Machine Works, Chicago, begins production of a new portable electric mixer which will be marketed under the trade name of "Double-Whirl."

Arthur W. Gray, formerly director of research, L. D. Caulk Co., and vice-president, Dielectric Products, Inc., joins staff of Brown Instrument Co. as associate director of research.

R. J. McMahon, Link & Belt Co., Chicago, and not Martin H Kidder, was the author of the article on "Portable Loaders" in our June issue.

Mines Safety Appliances Co., Pittsburgh, publishes Catalogue No. FA-1, covering its complete line of first aid materials. Copies will be furnished upon request to the company.

Chemicolloid Laboratories, New York, publishes new booklet describing "Charlotte Colloid Mills," copies of which will be furnished upon request to the company.

Combustion Engineering Corp., New York, announces new issue of the "Safety Valve," containing an article on "Baffling for Straight Tube Boilers."

International Nickel Co., New York, issues revised instructions for welding, brazing and soldering "Monel" metal and pure nickel.

Driver-Harris Co., Harrison, N. J., issues new booklet describing results obtained from industrial electric heat installations.

Surface Combustion Co., Toledo, issues new folder on the "SC continuous normalizing furnace."

P. H. & F. M. Roots Co., Connersville, Ind., issues new Bulletin No. 1011.

New International Wood Chemical Company Organized in London

Chemical and Wood Industries (Ltd.) is formed with registered office at 3 London Wall, London, E. C. 2, with a total share capital of £1,000,000 for the purpose of acquiring a controlling interest (over 77 per cent. of the share capital) in the Destilacija Drva D. D. (Wood Distillation Company) of Yugoslavia, which is understood to own the largest single installation for wood distillation in Europe. It also possesses timber concessions, sawmills, power stations, railways, and coal deposits in Yugoslavia. The distillation works is said to be equipped for the carbonization of 200,000 "stack meters" of wood annually, and the products include acetic acid, acetone, formaldehyde, methyl alcohol, charcoal, etc. The Yugoslav Government holds 200,000 priority shares in the Wood Distillation Company and will retain this holding under the new arrangement, according to the Department of Commerce. The new company, Chemical Wood Industries (Ltd.) is to a certain extent affiliated with the Distillers Co. (Ltd.) of Edinburgh, which controls the bulk of the production of both beverage and industrial alcohol in the United Kingdom.

Link-Belt Increases Dividend Rate

Link Belt Co. declares a quarterly dividend of 65 cents, payable September 1, to stock of record August 15, placing stock on $2.60 annual basis, against $2.40 previously paid.

Link Belt Co. reports for five months ended May 31, 1929, net income of $1,268,511, after depreciation, taxes and other charges, equivalent after allowing for dividend requirements on $4,000,000 of 6½% preferred stock to $1.63 a share on 709,182 no-par shares of common stock. This compares with net income of $1,069,163 or $1.35 a common share on basis of present capitalization in corresponding period of 1928.

The Public Service Commission, Albany, N. Y., approves new freight rates on acids (muriatic and nitrating) in tank cars carload as follows: By the Erie Railroad, from Black Rock, Buffalo and East Buffalo to Depew and North Tonawanda, 7c per cwt. reductions. Of the New York Central and West Shore Railroads from Black Rock, Buffalo to Depew and North Tonawanda, 7c per cwt. reductions. All effective January 6, 1929.

Interstate Commerce Commission announces that a tentative report on container car service is expected to be submitted soon. It is being prepared by Harry C. Ames, attorney-examiner of the commission's staff of experts and will cover the lawfulness and propriety of container car service both where it is now and where it is proposed to be extended.

Present freight rates on crude phosphate rock in carloads from Bartow, Fla., and related points to Jackson, Miss., are approved by the Interstate Commerce Commission in dismissing a complaint of the Jackson Fertilizer Co.

Phillips Fertilizer Co. plans erection of plant at Washington, D. C., with main building 120 by 200 feet, of wood and steel, with concrete floors and a composite roof.

U. S. Chemical Products Co., Pawtucket, R. I., plans construction of two or more plant units on Smith st. in that city, reported to cost over $75,000 with equipment.

A. L. Van Ameringen, aromatic chemicals, plans construction of new plant at Mountain View, N. J., to cost about $40,000 with equipment.

Brown Instrument Co., Philadelphia, announces removal of Boston office to 89 Broad st., that city.

I. G. Reports Progress During 1928
Listing Net at 118,458,000 Marks

I. G. Farbenindustrie reports clear profits for 1928 of 118,458,000 marks and a dividend of 12 per cent on its common stock. The 1928 clear profit is 17,646,000 marks more than its corresponding level for 1927 of 100,812,000 marks, when a 12 per cent dividend was also paid. The dye trust administration, however, preferred to assign an 11,700,000-mark fund to its reserves, bringing the latter up to 200,000,000 marks, and to use another 6,600,000 marks for a pension fund for its employees. This sum is 654,000 marks more than the increase in clear profits in 1928 over the 1927 net profit figure.

Production of the German dye trust was given as improved in all lines, despite adverse economic influences, particularly as they affected German farmers, who could buy quite as much artificial nitrogen fertilizer as in 1927, and the textile industry, using dyestuffs, etc., which suffered a considerable depression here in 1928.

Increased production of atmospheric nitrogen was reported by the German dye trust in 1928, particularly Leunasaltpeter (26 per cent primary nitrogen, calcium nitrate (15.5 per cent N and 28 per cent lime), and the five nitrophoska grades, presenting varying mixtures of the three artificial fertilizers, nitrogen, phosporic acid, and potash.

The second item of production of the trust is dyestuffs, probably at the rate of 75,000 to 80,000 tons annually, valued at around 400,000,000 marks. The dye trust's annual report points to a dyestuffs overproduction that led to an extension of its 1927 dye pact with France, regulating production and sales (if not by any close arithmetical division), by admission of Swiss producers, at the same time exchanging technical experience with the French.

The dye trust then states that it sold more dyes in 1928 than in 1927, although the textile industry was depressed. This is explained by the fact that consumers are adopting more the better and higher-priced dyes, supplied by the dye trust particularly in its indanthrene series.

Improvement in production of pharmaceutics is also reported by the I. G.; production is estimated at about 40 per cent of total German production of 10,000 metric tons annually. The value of a 4,000-ton production may be reckoned at around 80,000,000 marks. The dye trust is extending its sales branches abroad, while bringing out new specialties here.

Despite growing foreign competition and depression in the textile and leather industries in 1928, the dye trust's chlorine compounds sold better than before. The same applied to acids, and by-products, compressed gases, mineral colors, lithopone, vulcanization accelerators, and organic intermediates.

National Power Alcohol Co. is founded in Australia, with a capital of £250,000, of which half is in the hands of the Distillers Co. and the other half in the hands of Australian interests. A factory is being built at Mackay, North Queensland, and others will be built later at Townsville and Cairns. The alcohol will be produced from molasses and freed from water by a special process, in order that it may be readily mixed with petrol, forming a mixture of 15 per cent. of alcohol and 85 per cent. of petrol. This mixture will be put on the market as a motor fuel, under the name "Shellkol," the necessary petrol being supplied by the Shell Co., who will also take charge of the marketing arrangements.

British Industrial Solvents was organized early in 1929 with a capital of £500,000 to produce organic raw materials. The launching of this enterprise and the greatly increased demand for solvents by manufacturers of artificial leather and lacquers indicate satisfactory conditions in the organic branch of the chemical industry in Britain, reports the Department of Commerce.

Who's Who In Chemical Industry

Lawrence, William J., president, Vera Chemical Company. Born, Shelburne, Nova Scotia, 1891. Present connections, Western Paper Makers' Chem. Co., Kalamazoo, Mich., vice-pres., gen. mgr., Superior Pine Prods. Co., Fargo, Ga., pres.; Standard Chem. Corp., Kalamazoo, Mich., pres.; Vera Chem. Co., of Canada, Ltd., Burlington, Ont., Canada, pres. Memb. Amer. Chem. Soc., Tech. Assn. Pulp & Paper Ind. Hobby: golf. Address: Western Paper Makers' Chemical Co., Kalamazoo, Mich.

Mabey, Harry M., general traffic manager, Mathieson Alkali Works, Born Canada, 20 Feb. 1886; educat., public schools Newton, Mass.; Suffolk Law, Boston. New York Central Lines, Boston; Natl. Assn. Cotton Mfrs., Boston. Boston Army Supply Base, charge of freight traffic, 1918-19. Memb., (chemical Alkali traffic Assn., 1927); Electrochem. Traffic Assn. (chmn. 1922): Transp. Com., Chlorine Inst. (chmn. 1923); Traffic Mfrs. Council Assn. Inds. (chmn., 1925-27). Clubs: Chem. (N. Y.), Traffic, (N. Y.). Address: 250 Park Ave., New York City.

Mace, Charles Austin, secretary, Synthetic Organic Chemical Manufacturers' Association. Born, Mass., 1880; mar., I. L. Ferdinand, Chicago, Ill., 1904; children, 2 daus.; educat., Mass. Inst. Tech. 1897-1902. Dominion Text., Ltd., Can., chem., 1902-03; Armour & Co., by-products div., chem., 1903-07; Badische Co., tech. demonstrator salesman, 1907-16; Butterworth Judson Corp., Phila., 1922; Tower Mfg. Co., sales mgr., to 1927. Synth. org. Chem. Mfrs. Assn. Memb., Elks. Address: 1 Madison Ave., New York City.

Routh, Esse Edgar, sales mgr., Mathieson, Alkali Works, Inc. Born, Abingdon, Va., 4 Jan. 1886; mar., Brooke Jones, Union Level, Va., 17 Nov. 1917; children, four; educat., Va. Poly. Inst. and Davidson Coll. Mathieson Alkali Wks., asst. mgr. sales Bicarbonate 1909-12; mgr. sales bicarbonate 1912-19; southern sale. mgr., (all prods.), 1920; general sales mgr., 1928. Clubs: Shrine, Charlotte Country, Sou. Mfrs., Kiwanis. Hobbies: trout fishing, folg, music. Address: Mathieson Alkali Works, Inc., 250 Park Aver., New York City.

Walker, Mark, chief chemist, Pacific Roessler & Hasslacher Chemical Corp. Born, Glasgow, Scotland, 24 Apr. 1770; mar., Alice Viola Feldman, Tucson, Ariz., 24 Aug. 1895; children, 2 daus.; Exposed Reef Mining Co., Reef, Ariz., genl. mgr.; Sliver Bell Copper Co., Silver Bell, Ariz., metallurgist; Golden Cross Mines, Tumco, Calif., asst. genl. mgr.; private practice, Los Angeles, Calif. 1905-20. Joint Author of "The Decomposition of Liquid Hydrocyanic Acid" and "The Determination of the Strength of Liquid Hydrocyanic Acid, by Specific Gravity." Memb., Amer. Chem. Soc., (secy. Southern Calif. sect. 1922 to date); Amer. Inst., Mining & Met. Engrs. Clubs: Engineers (Southern Calif.), Sigma Xi (Southern Calif.). Hobbies: automobiling and secretarial work. Address, Pacific Roessler & Hasslacher ChemCo., P. O. Box 428, El Monte, Los Angeles, Calif Calif.

Woodruff, John Caulfield, research director, Commercial Solvents Corp. Born, Ft. Macinac, Mich., 15 Oct. 1887; mar., Mabel Whitney Stower, Plattsburgh, N. Y., 3 Sept. 1913; children, 2 sons; educat., Williams, A.B., 1909; Mass. Inst. Tech., B.S. Chem. Mgr., 1911. Major Chem. War. Serv., director Manufacturing and Development Section, Gas Defense Division, 1917-19. Southern Cotton Oil Co., chem. eng., 1911-13; Western Elec. Co., chem. eng., 1913-17; Wheeler & Woodruff, consltg. chem. eng., partner, 1919-25; Coml. Solvents Corp., res. dir., 1925 to date. Memb., Amer. Chem. Soc., Amer. Inst. Chem. Engrs., Delta Kappa Epsilon, Williams Club. Hobby: golf. Address: Commercial Solvents Corp., Terre Haute, Ind.

Chemical Facts and Figures

Past Month Featured By Many Mergers Within Chemical Industry

U. S. Industrial Alcohol Co. Plans Acquisition of Kentucky Alcohol—Newport Acquires Rhodia—American Cyanamid and Kalbfleisch Plan Consolidation—Calco Purchases Textile Chemical and King.

United States Industrial Alcohol Co. contracts to acquire and pay for with shares of its stock the assets and business of the Kentucky Alcohol Corp., a wholly owned subsidiary of the National Distillers' Products Corp. The last named company has contracted also to sell to the United Molasses Co., Ltd., London, its molasses business, represented by stock ownership in the Old Time Molasses Co., a Cuban corporation, and its half interest in the Eastern Alcohol Corp. The other half interest in the Eastern Alcohol Corporation is owned by E. I. du Pont de Nemours & Co.

Acquisition of the Kentucky company by U. S. Industrial Alcohol will mean an increase of the latter's allotment, under the bureau of prohibition's plan, by some 10,000,000 gallons. The sales force and plants of the Kentucky company will be absorbed without any radical changes in personnel, according to present indications. The plants are located at Westwego, La., and Peoria, Ill.

United Molasses Co., which is represented in this country by the Dunbar Molasses Co., will continue to operate the Eastern Alcohol plant at Deepwater under the same arrangement as now prevails. Entire output will be disposed of to E. I. du Pont de Nemours & Co., Inc., which will in turn dispose of any it does not need through U. S. Industrial Alcohol Co.

It is expected proceeds of the sale to United Molasses will be used by National Distillers for retirement of its preferred stock and outstanding 10-year 6½ per cent. notes.

United Molasses Co., Ltd., in payment for the molasses business of National Distillers' Products Corp., consisting of stock ownership of Old Time Molasses Co., Solex Car Line Corp. and 50 per cent. interest in Eastern Alcohol Corp., will make cash payment and issue to sellers 200,000 shares of fully paid United Molasses common.

Newport Chemical Works Acquires Rhodia in Expansion Program

Newport Chemical Works, Passaic, N. J., acquires business and assets of the Rhodia Chemical Co., New York, as part of an expansion program by which the Newport Co., the parent company, plans to spend $1,000,000 this year in extending and improving its recently acquired additions. It is understood that the present transaction does not include the Acetol Products Co., an associate of the Rhodia Company, nor is any immediate change contemplated in the operation or executive personnel of the latter company. Charles M. Kelly, sales manager, Rhodia Chemical Co., will continue in the same capacity for the Rhodia division, Newport Chemical Works.

Rhodia Chemical Co., whose plant is located in New Brunswick, N. J., is a large manufacturer of intermediate and finished coaltar products. In the latter class, its specialization has been chiefly in photographic developers and aromatic chemicals. It represents two large French producers of synthetic aromatics, the Societe Chimique des Usines du Rhone and Poulenc Freres. Until recently the Rhodia Chemical Co. was an importer of a number of heavy chemicals of German manufacture, particularly phosphates of soda. It disposed of its agencies for sodium phosphate and aluminum sulfate in the latter part of 1928, confining its operations in heavy chemicals to anhydrous sodium sulfite and pyridine.

Newport Chemical Works, whose special operations are in coaltar intermediates, dyes and solvents, and the Rhodia Chemical Co. have been users of each other's products. Reductions in costs are expected, therefore, to result from the consolidation.

American Cyanamid and Kalbfleisch Plan Consolidation of Assets

Directors of American Cyanamid Co. and Kalbfleisch Corp. approve consolidation of assets of Kalbfleisch Corp. with American Cyanamid, subject to approval of stockholders.

American Cyanamid Co. which operates a number of subsidiaries, manufactures chemicals for mining, metallurgical and general industrial use, coaltar products, and fertilizer materials. It has several plants in this country, in Canada and in Spain. The company has been carrying out an extensive program of expansion in recent months, lately acquiring the Calco Chemical Co., manufacturer of synthetic organic chemicals.

Kalbfleisch Corp. is one of the oldest chemical concerns in the United States. It celebrated its centenary in March, this year. It has six plants in this country and manufactures chemicals for the paper and textile industries, as well as a general line of industrial chemicals. Ore mines and a plant are operated by the company in Dutch Guiana. The corporation will continue to operate as a separate organization, and no change in its management is contemplated.

Calco Purchases Textile Chemical and King's Sulfur Dioxide Branch

Calco Chemical Co., Inc., Bound Brook, N. J., subsidiary of the American Cyanamid Co., purchases plant, business and good will of the Textile Chemical Co., Providence, and the sulfur dioxide division, King Chemical Co., also of Bound Brook. This makes a total of three businesses which have been acquired by Calco during the past few weeks, the purchase of Crown Chemical having been noted in these pages last month.

Textile Chemical Co. has specialized in the manufacture of alpha naphthol, Naphthol Yellow C. I. No. 10, Azo Yellow C. I. No. 146, Fast Light Yellow No. 3G C. I. No. 639 and Benzo Fast Red 8 BL C. I. No. 278. Manufacture of these products will be continued by Calco Chemical Co. King Chemical Co. will continue to operate its fertilizer and farm chemicals division, but the manufacture and sale of liquid sulfur dioxide will be carried on by Calco.

Tariff hearings on chemicals and allied products before the Senate Finance Committee, Senator Reed Smoot (Rep.), Utah, chairman, have been well attended during the past month. Among those who testified were A. L. Mullaly, Kuttroff, Pickhardt Co.; Scott L. Libby; Levi Coke, Glycero Phosphorus Co.; John Boyer, Monsanto Chemical Co.; E. R. Pickerell, General Dyestuff Corp.; Adair C. Humphreys, Heyden Chemical Works; W. A. Harshaw, Harshaw Chemical Co.; Edward H. Carus, Carus Chemical Co.; F. A. Lidbury, Oldbury Electro Chemical Co.; James J. Riley, Barium Reduction Co.; and B. D. Saklatwalla, Vanadium Corp.

Where is the parade *Going?*

IF you don't know, right now would be a good time to find out! And find out, at the same time, just what *your* place in the parade really is!

The parade we're talking about is the business parade. Some people can afford to sit on the sidelines—others have to keep in step or be left behind. New products, new ways of producing them, new merchandising methods—everything is changing in the light of scientific development.

We can help you keep in step—even move you farther toward the head of the procession. We have the facilities for research and development. You have the production problems. Let's get together. It won't cost you anything to go over your production plans with us. And it may mean a great deal to you. A conference can be conveniently set by mail or telegraph.

We are specialists in fractionating narrow distillation ranges of Petroleum Products. We will procure information on any special distillate you require. Generous samples of our products with expert counsel on how to use them will be sent on request. Shipments of our products are made in drum and tank car lots—in large industrial centers, in tank wagons.

IF your production needs a new product to speed it up, we'll develop it—these are some of our originations:

LACTOL—a 100% petroleum product; a thinner for use as a diluent and a vehicle to carry the active solvent in the manufacture of lacquers; has the same evaporating time as Toluol; generally used by large manufacturers of lacquers; many find it superior and more economical than Toluol.

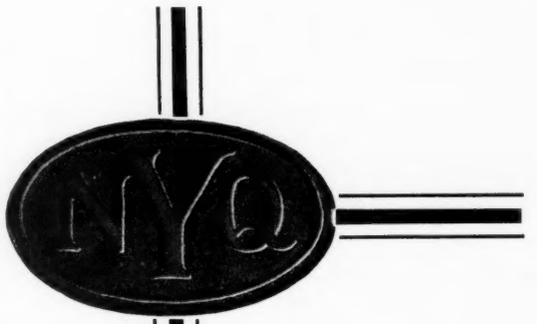
TEXTILE—a petroleum thinner for use in replacing Benzol, Toluol, and other coal tar solvents; has the same evaporating time as Benzol; widely used by large industries; artificial leather manufacturers, textile manufacturers, etc., as a substitute for Benzol; more efficient and more economical.

KEMSOLENE—a petroleum thinner for use as a diluent and a vehicle to carry the active solvents in the manufacture of lacquers; has an exceptionally high flash.

AMERICAN MINERAL SPIRITS COMPANY
308 So. Michigan Ave., Chicago

Eastern Representatives:
Chemical Solvents, Inc., 297 Fourth Ave., New York City

Canadian Representatives:
Wilson, Paterson, Gifford, Limited, Montreal · Toronto



Acetanilid

Bismuth Salts

Codein and its Salts

Ethyl Morphine

Iodoform

Opium, U. S. P.

Potassium Iodide

Quinine and its Salts

Thymol Iodide

Strychnine and its Salts

Morphine and its Salts

Menthol-Y

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304 South Fourth Street

Personal and Personnel

Lammot du Pont, president, E. I. du Pont de Nemours & Co., Inc., and chairman of the board, General Motors Corp., is elected president, Manufacturing Chemists' Association of the United States, succeeding Henry Howard, Grasselli Chemical Co., who had been president of the association since 1926. Other officers elected are vice-presidents, William B. Bell, president, American Cyanamid Co. and W. D. Huntington, president, Davison Chemical Co.; treasurer, Philip Schleussner, vice president, Roessler & Hasslacher Co.; and secretary John I. Tierney, Washington, D. C. The following are members of the executive committee: chairman, S. W. Wilder, Merrimac Chemical Co.; William H. Bower, Henry Bower Manufacturing Co.; C. W. Millard, General Chemical Co.; H. L. Derby, Kalbfleisch Corp.; George W. Merck, Merck & Co.; and J. A. Rafferty, Carbide & Carbon Chemical Co.

William H. Nichols, chairman of the board, Allied Chemical & Dye Corp., and vice-president, University Council, New York University, presides during the presentation of diplomas at the university's commencement exercises, June 12, in the absence of Elmer Ellsworth Brown, chancellor.

Ernest Twitchell, recipient of the Berlin Medal in 1917 for his invention of the saponification of fats, dies at his home in Cincinnati, June 6, aged 66. Prior to his resignation due to ill health, he was chairman, board of directors, Twitchell Process Co. and chemist, Emery Industries, since 1886.

Joseph P. Jaeck, for many years in charge of the technical service department, dyestuffs division, E. I. du Pont de Nemours & Co., Inc., dies June 20, at Fort Ticonderoga, N. Y. Before going with the du Pont company in 1916, he was connected with H. A. Metz & Co.

Irving Langmuir, president, American Chemical Society, and associate director of research, General Electric Co., is awarded the honorary degree of Doktor Ingenieur Ehrenhalber, by the Technische Hochschule zu Berlin-Charlettenburg, Germany.

John W. Kellerman, treasurer, Isaac Winkler & Bro. Co., Cincinnati, dies May 29, aged 52. He was born in Pleasant Ridge, Ohio, August 10, 1877, and had been with this company since 1894, being elected a director and treasurer in 1917.

C. A. Higgins, manager, development department, and C. C. Hoopes, treasurer, are elected members, executive committee, Hercules Powder Co., and C. D. Pickett, vice-president, is elected a member of the finance committee.

Peter J. Arnold, for the past sixteen years associated with A. Klipstein & Co., is now in the Boston office of Philipp Bros., Inc., as sales representative in the Massachusetts territory.

W. S. Landis, vice-president, American Cyanamid Co., is elected to membership in Epsilon Chi, honorary electrochemical society.

Frederick A. Marsh, secretary and treasurer, Baker Castor Oil Co., New York, dies at his home in Montclair, N. J., June 18, aged 66.

H. J. Pooley is appointed secretary, Society of Chemical Industry, succeeding H. T. F. Rhodes, resigned.

Charles A. Fox, chairman, Fox, Roy & Co., Plymouth, Eng., dies May 18, aged 81.

L. W. Rowell Succeeds E. L. Robins as President of Fertilizer Assn.

L. W. Rowell, manager, fertilizer department, Swift & Co., Chicago, is elected president, National Fertilizer Association, succeeding E. L. Robins. Other officers are vice-president, Bayless W. Haynes, president, Wilson & Toomer Fertilizer Co., Jacksonville; and executive secretary and treasurer Charles J. Brand, Washington. New members elected to the board of directors for three year terms are: W. T. Wright, sales manager, F. S. Royster Guano Co.; John E. Sanford, vice-president, Armour Fertilizer Works; Robert S. Bradley, president, American Agricultural Chemical Co.; C. G. Wilson, president, Virginia-Carolina Chemical Corp.; Wilbur Miller, president, Davison Chemical Co.; J. Ross Hanahan, president, Planters' Fertilizer & Phosphate Co.; George Cope, president, Chatham Chemical Co.; and Wood Crady, vice-president, Federal Chemical Co.

Naval Stores Advisory Committee Formed to Assist Bureau of Soils

Naval stores advisory committee, formed to confer with the Bureau of Soils and Chemistry in connection with its work on turpentine and rosin consists of the following: J. B. Davis, J. B. Davis & Co., Albany, Ga.; Frank L. Fogarty, Wood Chemical Products Co., Jacksonville, Fla.; H. L. Kayton, Carson Naval Stores Co., Savannah; J. E. Lockwood, Hercules Powder Co.; C. L. Morrison, Morrison Co., Olustee, Fla.; J. C. Nash, Columbia Naval Stores Co., Savannah; Robert M. Newton, Newton Naval Stores Co., Wiggins, Miss.; C. F. Speh, secretary-manager, Pine Institute of America, Inc.; Thos. J. Taylor, Taylor, Lowenstein & Co., Mobile; and H. M. Wilson, Baldwin-Lewis Pace Co., Jacksonville.

John Calder Hebden

John Calder Hebden, vice-president and general manager, Dyeing Processes Corp., Providence, and co-inventor of the Franklin dye process, dies at Providence, June 4, aged 66. His home was in Brooklyn, N. Y., and he was born in Colgate, Fla., in 1862. He was graduated from Brown University in 1885 and then was successively chemist, National Worsted Mills, 1885-87; chemist, William J. Matheson & Co., 1887-1904; and chemist, A. Klipstein & Co., 1904-09. He was one of the country's foremost authorities on explosives and was a member of the American Chemical Society, American Institute of Chemical Engineers, Society of Chemical Industry, Chemists' Club (New York), Societe de la Chemie Industrie, and University Club (Providence).

Hannah B. Nichols, wife of William H. Nichols, chairman of the board, Allied Chemical & Dye Corp., dies June 20, as a result of injuries sustained in an automobile accident in Brooklyn, the previous day.

Harriet Winfield Gibson, chief, chemical reserach bureau, E. I. du Pont de Nemours & Co., Inc., during the World War, dies at Harrisburg, N. J., June 2.

Eastman Kodak Co. publishes booklet entitled "X rays in Industry," copies of which will be furnished upon request to the company.

Hydrocarbon Products Co., New York, moves to larger quarters on the eighth floor of its present home at 117 Liberty st., that city.

C. W. Jacob & Allison, gums and waxes, New York, announces removal to 162 Water st., that city.

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Butyl Alcohol Sec.
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Refined Fusel Oil
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Dimethyl Phthalate
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Diamyl Phthalate
Dibutyl Phthalate
Dibutyl Tartrate
Triacetine

Special Solvents and Plasticizers

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ORANGE, N. J.

News of the Companies

Barrett Co. establishes at Rutgers University a fellowship on the nutrition of horticultural crops which will provide an income of $3,000 annually. Co-operative research is to be carried on between the University and the American Petroleum Institute on the significance of micro-organisms in the decomposition of organic matter and their possible relation to the formation of petroleum.

Davidson Chemical Co. has issued 32,682 additional shares of common stock for the purpose of acquiring control of Central Chemical Co., Berkshire Chemical Co. and Lancaster Bone Fertilizer Co., all manufacturers of fertilizer. Central Chemical does a business of about 120,000 tons of fertilizer annually, and the other two a total of about 25,000 tons.

General Electric Co. offers new line of nitrocellulose lacquers in a wide range of colors to be marketed under the trade name of "Glyptal." The line is to be manufactured at the Bridgeport offices of the company, and is said to be oil-resistant, highly protective, and ideal for flexible insulating coatings.

Godfrey L. Cabot, Inc., announces that its Lima, Okla., plant will begin operations about August 1. Present production at its new plants in Texas is at the rate of 200,000 pounds of carbon black daily, which will be increased to 265,000 pounds before the end of the summer.

Atlanta Chemical Co., Atlanta; Carus Chemical Co., La Salle, Ill.; Columbus Fertilizer Corp., Columbus, Ga.; Manahan Chemical Co., New York; and United Chemical Co., Dallas, are accepted into membership of the National Fertilizer Association.

Nitrate Research Corp., Calvert Building, Baltimore, is incorporated with capital stock of 5,000 shares of $100 common stock, to carry on research relative to the nitrogen industry. Carroll A. Wilson, Leo Gottlieb and Harold R. Moore are named as incorporators.

Innis, Speiden & Co., Inc., announces removal of executive offices, together with the New York offices of its subsidiaries, Isco Chemical Co., Isco Bautz Co., and Wilbur White Chemical Co., to 117 Liberty st., New York.

Hercules Powder Co. announces that as of July 1 it succeeds to the assets and business of the Virginia Cellulose Co., a wholly owned subsidiary, and will carry on the business of that company as the Virginia Cellulose department of the company.

Commercial Solvents Corp. completes construction of butyl acetate plant at Peoria, Ill. Company's plant at Terre Haute, Ind., at which it had been making butyl acetate and butyl alcohol, will now be devoted exclusively to the latter.

U. S. Industrial Chemical Co., New York, is said to be experimenting with a new process for the manufacture of cellulose acetate which will have a production cost lower than that for methods now in use.

E. I. du Pont de Nemours & Co., Inc., announces through its advertising director, William A. Hart, that effective January 1, 1930, its advertising account will be handled by Batten, Barton, Durstine & Osborne, Inc.

Monsanto Chemical Works announces the addition of C. P. sulfuric acid, C. P. muriactic acid and C. P. nitric acid to its list of products.

Procter & Gamble Co., Cincinnati, purchases Duz Co., New York, manufacturer of cleansing specialties.

Seven Producers Group To Form Solvents Institute

Solvents Institute, Inc., is organized in New York with the following membership: American Solvents & Chemical Corp.; E. I. du Pont de Nemours & Co.; Franco-American Chemical Co.; Kessler Chemical Co.; Merrimac Chemical Co.; U. S. Industrial Chemical Co.; and the Van Schaack Bros. Chemical Works. Officers are president, Glenn L. Haskell, U. S. Industrial Chemical Co.; vice-president, William Holter, Van Schaak Bros. Chemical Works; secretary-treasurer, John M. Kessler, Kessler Chemical Co.; and executive officer, Robert T. Baldwin. Offices are at 50 East 42nd st., New York.

United Chemicals Secures Control of Curtin-Howe

United Chemicals Corp., New York, acquires control of the Curtin-Howe Corp. and subsidiaries, specializing in timber preservation. Curtin-Howe Corp. was formed in 1927 to promote sale of zinc meta-arsenite for treatment of all timber to preserve it from decay. This product was developed in the laboratories of the Western Union Telegraph Company by Leo Curtin, chief consulting chemist, and his staff, primarily for the treatment of lumber used by the telegraph company, which has a license agreement with the Curtin-Howe Corporation for the use of the process.

Electro Bleaching Gas Patent Held Valid and Infringed

Patent of Electro Bleaching Gas Co. and Wallace & Tierney Co., plaintiffs, on process of antiseptiicizing water, is held valid and infringed by United States District Court, Eastern District of New York, in suit against Greenpoint Sewerage Co., defendants. Court held that addition of a new step to a process is insufficient to avoid infringement of a patent and a decree may be entered in favor of the plaintiffs against the defendants, with injunctions, costs and the usual order of reference.

Steam and solvents branch of the naval stores industry adopts a code of business rules in conference with the Federal Trade Commission. Those present were S. J. Spitz, J. H. McCormack and E. E. Holdman, Newport Co.; F. W. Kressman and W. H. Crawford, Continental Turpentine & Rosin Corp.; T. F. Dreyfus and Sidney Lowenstein, Dixie Pine Products Co.; and L. N. Bent, Jesse Gibson, J. C. Haile, and J. E. Lockwood, Hercules Powder Co.

E. I. du Pont de Nemours & Co., Inc., authorizes issue of 10,713 additional shares of common stock for acquisition of entire minority interest in Lazote, Inc. The du Pont company has heretofore owned a majority of the stock of Lazote, which operates a plant at Belle, W. Va., for the fixation of atmospheric nitrogen.

Reagent, synthetic, and fermentation grades of acetones will again become subject to the key industries duty of 33⅓ per cent. ad valorem when imported into the United Kingdom, effective July 1, 1929, according to the Department of Commerce.

Monsanto Chemical Works, through its subsidiary, Graesser-Monsanto Chemical Works, Ltd., purchases business, manufacturing facilities and good will of British Saccharin Manufacturing Co., Baxenden, Lancashire.

American I. G. Chemical Corp. leases two floors for a period of ten years, in the Lefcourt-National Building, 521 Fifth ave., New York.

Test them Yourself!

Trisodium Phosphate
Disodium Phosphate

BOWKER'S Trisodium Phosphate stands every test for cleaning, water softening and boiler compounds.

Bowker's Disodium Phosphate meets the full requirements of the most exacting and biggest silk weighters and finishers in the industry.

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Vanderbilt 0500 Cables: Graylime

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Acetate of Soda

Acetone C. P.

Methanol
(all grades)

Methyl Acetone

Denatured Alcohol
(all formulas)

Formaldehyde

Phenol U. S. P.

Benzol

Whiting

Magnesium Carbonate

Magnesium Oxide

Quinine Bisulphate

Chemical Salesmen Battle With Par In Annual Spring Tournament

Despite the fact that the National Open started on the same day, some seventy-five of the cream of the chemical industry's golfers turned out at the Canoe Brook Country Club, Summit, N. J., on June 27, for the annual Spring golf tournament, quoits pitching contest, etc., of the Salesmen's Association of the Chemical Industry. Eddie Sterck, who was in hot putting form, lapped the field to take the low gross prize with an 83, which score included as many as 8 one-putt greens. After him, the scores fell away fast, which enabled Eddie Orem to place second with a 94. He was closely pressed by Burton T. Bush who also turned in a card of 94, but lost in the playoff, which consisted in matching pennies.

The boys who were fortunate enough to have their handicaps unmolested by the handicap committee were Barney Gogarty, Bill Webb and Ira Vandewater. As a consequence, they won the prizes for low net, finishing in the order named with 71, 72, and 73 respectively. Five prizes were given for the good guessers in the blind handicap tournament and these were gathered by Vic Williams, George Uhe, Doc Dorland, Rupe Watson and Billy Adkins. The quoits pitching proved to be no contest with Oscar Lind and Grant Dorland out-tossing Art Benkert and Wulf Swenson.

United Feldspar Corp. Formed; Appoints R. & H. As Sales Agent

United Feldspar Corp. is formed to acquire the capital stocks of the Tennessee Mineral Products Corp., Spruce Pine, N. C.; Oxford Mining & Milling Co., West Paris, Me.; Perham Crystal Feldspar Mines, Oxford Co., Me.; and the U. S. Feldspar Corp., Cranberry Creek, N. Y. The Roessler & Hasslacher Chemical Co., New York, has been appointed selling agent for the products of the merged companies, and will act as New York office for the corporation.

Kentucky Color & Chemical Co., Louisville, acquires controlling interest of the National Ultramarine Co., Norwood, Ohio, and will direct the sales of the latter company's products. The latter company has been reorganized with the following officers: president, Neil B. Conley; vice-president and sales manager, Sevier Bonnie; treasurer, Robert Bonnie; and secretary, James F. Pflum.

J. T. Baker Chemical Co. Analytical Fellowship, Eastern Division, for 1929-30 has been awarded to Charles H. Greene, who will investigate "The Solubility of Precipitates in Dilute Solutions of the Precipitant" at Harvard University, under the direction of G. P. Baxter.

International Nitrate Agreement Links Natural and Synthetic Sale

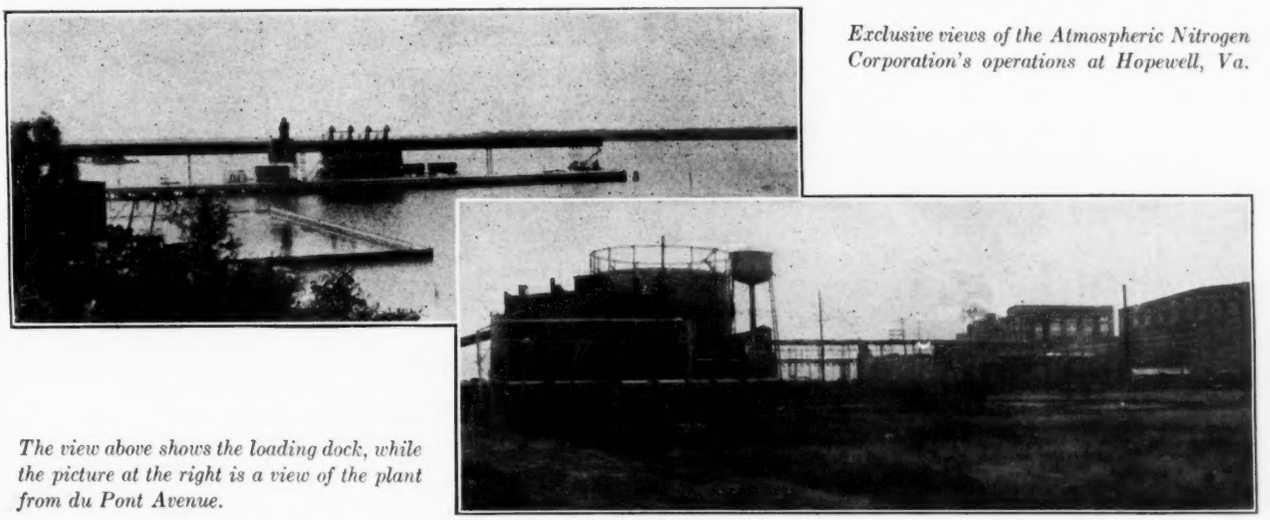
German, British, and Chilean nitrate interests arrive at an international nitrate agreement thus linking the natural with the synthetic production and marketing of this material. This agreement is said to have been concluded by Dr. Carl Bosch, representing the I. G. Farbenindustrie, Don Pablo Ramirez, representing the Chilean Government and the Chilean nitrate interests generally, and a representative of Imperial Chemical Industries. According to the agreement, the price relationship between Chilean and synthetic nitrates is to remain unchanged, but common selling will be started soon.

So far as is at present understood, the price agreement will not apply to the United States and the Anglo-Chilean Consolidated Nitrate Corp. will be bound to the agreement only as it affects other markets than the United States. Under the new price schedule announced as a result of this agreement, both the synthetic and the Chilean nitrate prices are reduced 6 per cent. This reduction evidently applies only to European markets, for new prices announced here are not that much lower. Based upon last year's production, this will involve a reduction of 30,000,000 marks in annual earnings of the I. G., everything else being equal.

National Oil Products Announces New Line of Solutised Oils

National Oil Products Co., Harrison, N. J., announces a new line of "solutised oils," which are emulsifiable in water without the aid of any emulsifying agents. These products are marketed under the trade name of "Albasol" and are the results of processing certain fixed oils, fats and waxes so that they retain their natural characteristics but become emulsifiable in water. Among the products thus processed are olive oil, castor oil, neatsfoot oil, spermaceti, stearic acid, beeswax, Japan wax, palm oil, peanut oil, coconut oil, cottonseed oil, rapeseed oil, chinawood oil, linseed oil, menhaden oil, cod oil, codliver oil, sperm oil, oleic acid (red oil), tallow, carnauba wax, wool grease, mineral wax, oleostearin, and various mixtures.

Insecticide & Disinfectant Manufacturers' Association holds annual summer meeting at Hotel Edgewater Beach, Chicago, June 10-12. Among the speakers were John Van de Vries, Chamber of Commerce of the United States, on "The New Competition;" Franklin Johnston, American Exporter, on Foreign Markets; and John Powell, John Powell & Co., on National Insect Killing Week, which is being planned by the association for July 7-14.



Exclusive views of the Atmospheric Nitrogen Corporation's operations at Hopewell, Va.

The view above shows the loading dock, while the picture at the right is a view of the plant from du Pont Avenue.

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Standard Quality

President Hoover Increases Linseed Oil Tariff to 3 7-10 Cents

President Hoover, June 25, issues a proclamation increasing the tariff on linseed or flaxseed oil, raw, boiled or oxidized, from 3 3-10 cents per pound to 3 7-10 cents per pound. The president's action was taken under the flexible provisions of the Tariff Law and followed an increase of 16 cents per pound of flaxseed which was promulgated several months ago. After the increase in flaxseed, had been made known, a compensatory increase on the oil was urged.

New York Alcohol Jobbers Plan to Form Trade Association

Alcohol jobbers of the New York district plan formation of an association to improve trade practice. No name has as yet been given to the new organization but an executive committee consisting of Charles L. Read, chairman, E. Rabinowe, R. Renouf and I. Sagavitz, has been appointed to work out the details of organization and draw up a code of ethics.

Fertilizer Business Code Approved by Federal Trade Commission

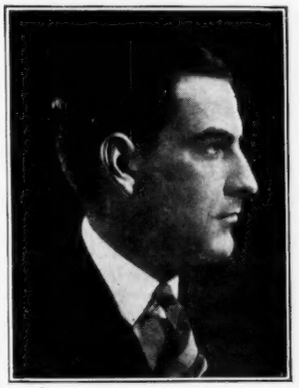
Federal Trade Commission approves the three rules of business conduct adopted by the fertilizer industry at the trade practice conference last winter. On the basis of tonnage, 75 per cent. of the industry was represented at this conference. The rules approved by the commission apply to violations of the law.

Rule one declares that sale of goods below cost for the purpose and with the intent of injuring a competitor and with the effect of lessening competition is an unfair trade practice.

Rule two enunciates the general principle that granting of secret rebates constitutes an unfair trade practice and lists specific practices as violations of the principle.

Rule three is to the effect that defamation of a competitor, either by imputing to him dishonorable conduct, inability to perform contracts or questionable credit standing, or the false disparagement of the grade or quality of his goods, is an unfair trade practice.

American Commercial Alcohol Corp. acquires Orleans Distilling Co.



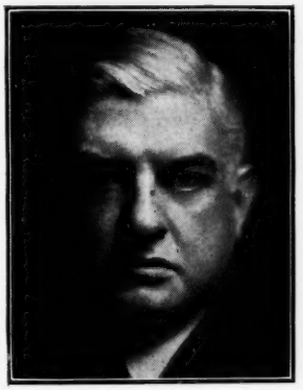
Edgar M. Queeny
Pres., Monsanto Chemical Works

Russell R. Brown
Pres., U. S. Industrial Alcohol Co.

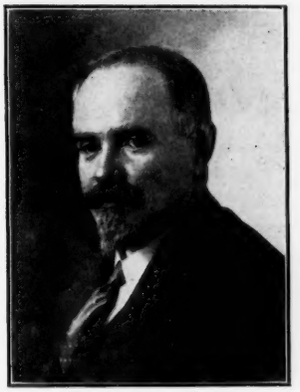
Elvin H. Killheffer
Pres., Newport Chemical Works

Men in the Month's Mergers

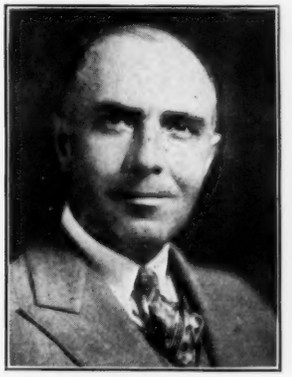
The past month might well be termed the month of many mergers. Among those who consolidated their interests during June are American Cyanamid—Kalbfleisch; U. S. Industrial Alcohol—Kentucky Alcohol; Newport—Rhodia; Monsanto—Rubber Service Laboratories; and Calco—King.



Sid Klein
Vice-pres., Kentucky Alcohol Corp.

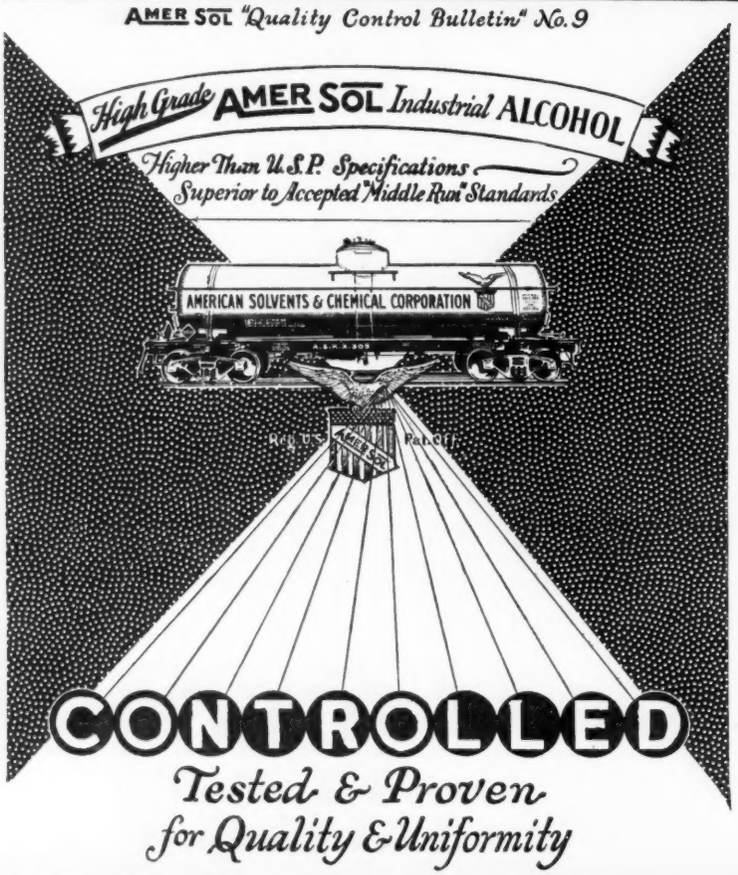


Max Mueller
President, Rhodia Chemical Co.



Harry L. Derby
President, Kaldfleisch Corp.

AMER SOL "Quality Control Bulletin" No. 9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The Financial Markets

Anglo-Chilean—Lautaro Merger Brings Year's Largest Bond Issue

Working Agreement Reached Between American and British Producer—$32,000,000 Bond Issue Accompanies Announcement—Lautaro Nitrate Corp. Formed as New Holding Company.

Lautaro Nitrate Corp. is incorporated in Delaware and a $32,000,000 bond issue is offered publicly, thus bringing to a conclusion negotiations by which Lautaro Nitrate Co., Ltd., London, acquires new plants and processes, patents for which were formerly held by the Anglo-Chilean Consolidated Nitrate Corp. To obtain for their holdings the benefits of the Guggenheim process, stockholders of the Lautaro Nitrate Co., Ltd., trade their equity for fixed dividend stock, thereby releasing to Guggenheim Brothers a part of that equity. In return Guggenheim Brothers agree to transfer their process to the Anglo-Chilean Consolidated Nitrate Corp., in which they own a majority stock interest, while Anglo-Chilean in turn grants a license to the Lautaro Company.

The bonds, maturing on July 1, 1954, are accompanied by warrants giving holders the right to receive next January 1, without cost, ten shares of no par value common stock of the Lautaro Nitrate Corp., a Delaware corporation. In addition to the warrants, each $1,000 principal amount of bonds will be convertible at the option of the holder up to July 1, 1939, into ten shares of seven per cent. cumulative preferred stock of $100 par value of the Lautaro Nitrate Co., Ltd., and four shares of no par common stock of the Lautaro Nitrate Corp.

Following the completion of the financing the outstanding capitalization of the company will include the present bond issue: £1,119,745 of 6½ per cent first mortgage debenture stock, due in 1940; £1,126,380 of 6 per cent first mortgage (Antofagasta) debenture stock, also due in 1940: £8,000,000 of seven per cent cumulative preferred stock, sterling series of £5 per share par value, and 2,000,000 shares of common stock of one shilling par value per share.

Lautaro Nitrate Corp., will own all the 2,000,000 shares of the company's common stock. The Lautaro Nitrate Corp.'s authorized and outstanding capitalization will include 4,000,000 shares of no par common stock, of which Anglo-Chilean Consolidated Nitrate Corp. will own more than half. Guggenheim Brothers own more than a majority of the common stock of Anglo-Chilean Consolidated Nitrate Corp.

International Salt Co. and subsidiaries report for year ended December 31, 1928, net income of $439,595 after interest, taxes, depreciation and depletion, equivalent to $7.23 a share earned on 60,771 shares of stock. This compares with $327,020 or $5.38 a share in 1927.

United Chemicals, Inc., for quarter ended March 31, 1929, reports net profit of $176,233 after charges and taxes. Company has cash on hand and call loans of $3,472,000 and no debts with the exception of $405,000 deferred purchase money obligations.

Spencer Kellogg & Sons, Inc., offers stockholders of record June 24 rights to additional stock on the basis of one share at $32 to every 10 shares held. Rights will expire July 15. Stock required for this offering is now held by the company as treasury stock.

U. S. Industrial Alcohol Co. Nets $954,264 in First Quarter Report

Statement of U. S. Industrial Alcohol Co. filed with New York Stock Exchange for quarter ended March 31, 1929, shows net income of $954,264 after depreciation, federal taxes, etc., equivalent to $2.98 a share earned on 320,000 no-par shares of stock.

U. S. Industrial Alcohol Co. will pay for assets of Kentucky Alcohol Corp., subsidiary of National Distillers Products Corp., 51,000 shares of its common stock. Total outstanding capital stock will be increased to 371,000 no-par common shares from 320,000 shares.

Income account for quarter ended March 31, 1929, follows: Net sales $9,413,326; costs, expenses, depreciation, etc., $8,536,432; operating profit $876,894; other income $207,497; total income $1,084,391; federal taxes $130,127; net income $954,264.

I. G. Offers Shareholders Rights in New Swiss Holding Company

I. G. Farbenindustrie gives shareholders right to subscribe for one share of the International Company of Chemical Enterprises, with a par value of 500 Swiss francs for each 6,000 reichmarks of common stock now held, at 750 francs a share, equivalent to $145. The International company is the new Swiss holding company for the German dyes trust.

Holders of the I. G. Farbenindustrie debentures will have the right to subscribe to one Swiss share for each 12,000 reichmarks now held. An annual dividend of 12 per cent. has been guaranteed on the Swiss stock by the German dyes trust. If the guarantee is withdrawn, shares of the Swiss company may be exchanged, for shares of the German company on a share for share basis.

Heller & Merz Co., for the year ended Dec. 31, 1928, reports: Assets: Merchandise, $974,374; accounts receivable, $189,605; cash, $167,720; supplies, $51,559; prepaid, $15,597; total assets, $1,398,855. Liabilities: Common stock, $1,000,000; accounts payable, $132,112; reserves, $8,728; surplus, $258,015; total liabilities, $1,398,855.

American Cyanamid Co. declares quarterly dividends of 40 cents each on the Class A and Class B common, placing issues on $1.60 annual basis, against 30 cents and 10 cents extra quarterly previously, and the regular quarterly dividend of $1.50 on the preferred, all payable July 1 to stock of record June 15.

Allied Chemical & Dye Corp. declares regular quarterly dividend of $1.50 on common, payable August 1 to stock of record July 11.

International Printing Ink declares regular quarterly dividends of 62½ cents on common and $1.50 on preferred, both payable August 1 to stock of record July 15.

Air Reduction Co. declares a quarterly dividend of 75 cents, payable July 15 to stock of record June 30, placing stock on $3 annual basis, against $2 previously.

Merrimac Chemical Co. declares regular quarterly dividend of $1.25 a share payable June 29 to stock record June 15.

Acetol Products, Inc., omits quarterly dividend of 60 cents on Class A, due at this time,

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Cornstalk Products Increases Common Stock to 600,000 Shares

Cornstalk Products Co., Inc., increases authorized common stock from 250,000 shares to 600,000 shares. Holders of the 25,000 shares outstanding $7 Class A stock were offered the right to convert one share of Class A into four shares of common. Retirement of the Class A will leave the company with only common stock outstanding.

Cornstalk Products will now absorb Euroamerican Cellulose Products Corp., holder of foreign patent rights to pulp making and chemical by-products. Cornstalk Products manufactures cellulose pulp and chemical by-products from cornstalks, straw and sugar cane refuse.

General Dyestuff Corp. Lists Assets at $3,223,630 for 1928

General Dyestuff Corp., for the year ended Dec. 31, 1928, reports: Assets: Furniture, fixtures, etc., $148,888; merchandise, $1,792,283; notes receivable, $16,162; accounts receivable, $1,021,268; cash, $236,099; securities, $590; deferred charges, $8,340; total, $3,223,630. Liabilities: Common stock, $600,000; accounts payable and accruals, $2,439,881; surplus, $183,749; total, $3,223,630.

Globe Chemical Co., Boston, for the year ended December 31, 1928, reports: Assets: Machinery, $845; steel barrels, $1,580; merchandise, $2,703; accounts receivable, $4,613; cash, $8,174; securities, $30,633; formulae, $159,526; treasury stock, $1,500; total assets, $209,574. Liabilities: Common stock, $175,000; accounts payable, $710; surplus, $18,394; profit and loss, $15, 470; total liabilities, $209,574.

Canada Gypsum & Alasbastine, Ltd., calls for redemption the issue of $1,000,000 6% convertible debentures. Under conditions surrounding the issue, the company may call the debentures at this time at 104¾. Notice of 60 days has to be given and during this time the debentures may be converted into common stock of no-par value at a rate of ten common shares for each $1,000 debenture.

Stockholders of By-Products Coke Corp. votes to increase authorized capitalization to 800,000 no-par shares, from 200,000 to provide for 300% stock dividend to be paid stockholders of record June 15. Company also declared usual extra of 50 cents and regular quarterly dividend of 50 cents on common, both payable June 25 to stock of record June 10.

Ruhr Chemical Corp. is extended $3,000,000 credit by Dillon, Read & Co. Proceeds of the credit will enable the Ruhr Chemical Corp. to double its plant capacity. The company has the only plant in Germany combining the Concordia, Linde and Casale processes for turning gas into nitrogen products for fertilizers.

United States Leather Co. declares four quarterly dividends of $1 each on Class A stock, out of 1928 earnings payable January 2, April 1, July 1 and October 1 to stock of record December 21, 1928, March 11, 1929, June 10 and September 10, respectively. This places stock on $4 annual basis.

Standard Chemical Co., Montreal, for year ending March 1929, reports gross profits of $275,769, as compared with $212,421 for the preceding year and net profits of $209,067, as against $139,667. Sales for the year aggregated $2,200,543 as compared with $1,785,243.

Shareholders of Rio Tinto Co., Ltd., approves creation of 50,000 new £5 par shares.

American I. G. Chemical Corp. Lists Assets at $61,407,177

Statement of American I. G. Chemical Corp. filed with N. Y. Stock Exchange, as of May 31, 1929, shows total assets of $61, 407,177 and paid-in surplus of $17,771,850.

Balance sheet of American I. G. Chemical Corp., as of May 31, 1929, follows:

Assets: Cash and demand loans, $10,956,107; loans due within 30 days, $5,690,000; bills and accounts receivable, $21,071,948; securities, $20,767,000; organization expense and deferred charges, $2,768,321; accrude interest, $153,801; total, $61,407, 177.

Liabilities: Notes and accounts payable, $408,053; accrued interest payable, $138,906; guaranteed 5½% convertible debentures, $29,990,000; common stock A, represented by 400, 170 no-par shares, $10,004,250; common stock B, represented by 3,000,000 no-par shares, $3,000,000; paid-in surplus, $17,771,850; net profit to May 31, 1929, $94,118; total, $61,407,177.

Van Schaack Bros. 1928 Assets Total $1,572,817 in Annual Report

Van Schaack Bros. Chemical Works, Inc., Boston, for the year ended Dec. 31, 1928, reports: Assets: Real estate, buildings, $583,545; machinery, $230,732; furniture, fixtures and tools, $33,750; drums, $109,720; merchandise, $254,074; notes receivable, $2,571; accounts receivable, $311,851; cash, $16,186; securities, $1,500; cash value life insurance, $4,037; prepaid expenses, $10,092; deferred charges, $14,759; total assets, $1,572,817. Liabilities: Common stock, $438,800; mortgages, $250,000; reserve for depreciation, $197,015; accounts payable $149,507; notes payable, $50,000; reserves, $18,539; surplus, capital, $261,426; surplus, earned, $207,530; total liabilities, $1,572,817.

United Dyewood Corp. Reports Net of $549,723 for 1928

Report of United Dyewood Corp. and subsidiaries for year ended December 31, 1928 shows consolidated net income of $549,723 after depreciation, federal taxes, general reserves and other charges, equivalent after subsidiary and 7% preferred dividends to $1.82 a share on 139,183 shares of common stock. This is the first consolidated statement issued in several years. In 1927 report of United Dyewood Corp. (holding company), excluding subsidiaries, showed net income of $213,431 and consolidated statement of subsidiary companies showed an undistributed surplus of $193,457 or a total of $406,888, equivalent after 7% preferred dividends to 93 cents a share on the common.

Westvaco Nets $302,000 for Quarter

Westvaco Chlorine Products Corp. reports for quarter ended March 31, 1929, net earnings of $302,000 against $128,000 in same period of 1928. Preferred dividend requirements amounted to $40,000, while cash on hand and call loans totaled $1,541,000.

British Celanese, Ltd., declares initial semi-annual dividends of 3½% on first preference shares, £1 par, and 3¼% on cumulative participating preference shares, £1 par, both payable April 30.

Canada Gypsum Co., in first financial statement, reports for year ended December 31, 1928, net profits of $750,410.

Montecatini declares dividend of 18 lire per share.

The Industry's Stocks

1929 June 29 High	1929 June 29 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In June	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
								NEW YORK STOCK EXCHANGE					
145¼	145¼	153¼	95¼	99¾	59	142,200	611,800	Air Reduction	No	683,873	$2.00	9 mo. 3.70	10.74
325½	325½	328	241	252¾	146	73,800	438,000	Allied Chem. & Dye	No	2,178,109	6.00		10.03
...	...	125	120½			2,000	15,700	7% pfd.	100	392,849	7%		62.59
11½	11½	23½	10½	26	15¾	11,500	148,000	Am. Agricultural Chem.	100	333,221	...		1.59
45	45	73½	40½	79½	55½	11,300	99,700	pfd.	100	284,552	...		7.86
152½	152½	154	107¾	117½	70½	904,200	7,208,100	American Can	25	2,473,998	3.00		4.11
...	...	142	139	147	136½	3,700	22,300	pfd.	100	412,333	7%		31.66
64¾	64	81½	50	63¾	39	62,000	1,235,600	American Metal, Ltd.	No	595,114	*3.00	9 mo. 2.30	3.64
...	...	135	113¾	117½	109	1,400	22,000	pfd	100	99,907	6%	9 mo. 18.92	50.27
110½	107	124½	93½	293	169	233,800	2,241,900	American Smelt. & Refin.	100	609,980	4.00	6 mo. 10.61	19.64
...	...	138	130	142	131	2,000	20,200	pfd.	100	500,000	7%	6 mo. 16.44	30.96
28⅞	28	49½	24½	57	6¾	42,400	492,100	Amer. Zinc & Lead	25	193,120	...		...
96½	95	111½	94½	117¾	40	1,900	35,100	pfd.	25	96,560	...		d2.72
119½	117	140	99	120½	53½	2,745,800	17,315,300	Anaconda Copper Mining	50	3,302,817	6.00		3.37
31⅜	39	49½	29	112¾	55½	12,100	277,000	Archer Dan. Mid.	No	213,712	4.00	7.34	5.77
...	...	115	114			20	2,120	pfd.	100	43,000	7%	16.94	37.39
101	100	115	90	114	63	19,400	83,000	Atlas Powder Co.	No	261,438	4.00	6.30	5.75
...	...	106½	100	110½	102	190	2,820	pfd.	100	90,000	6%	6 mo. 10.83	22.71
72½	72½	73½	53½	66½	50	749,700	4,151,000	Atlantic Refining	25	500,000	1.00	9 mo. 21.72	1.83
5	4¾	9½	4½	12¼	4½	38,700	263,900	Butte Copper & Zinc	5	600,000	...		0.10
7	7	12¾	6½	16¾	8¾	6,700	112,000	Butte Superior Mng.	10	290,198	2.00	9 mo. 0.16	0.94
127	127	138	104½	122	65	7,400	158,800	By Product Coke	No	189,936	*5.00	9 mo. 5.78	5.68
...	...	4	1½	5⅜	1⅜	6,000	187,800	Calla Lead & Zinc	10	724,592	...	9 mo. ...	0.10
43	42½	61½	36½	47⅜	20½	87,100	1,857,400	Calumet & Hecla	25	2,005,502	2.50	9 mo. 0.95	0.29
23½	23½	28½	16½	119	61½	19,000	157,100	Certainteed Prod.	No	400,000	...	9 mo. ...	5.31
...	...	81½	47½	63½	23½	1,700	7,800	7% pfd.	100	62,904	7%	9 mo. 0.87	56.80
...	...	127½	71½	74¾	37¾	400	1,331,400	Chile Copper	25	4,415,497	3.00	6 mo. 1.96	2.51
195½	192	199	121½	134¾	79	91,300	418,700	Columb Carbon	No	402,131	...	9 mo. 5.24	4.83
444½	444½	446½	225¼	250½	137¾	87,300	341,600	Commercial Solvents	No	217,722	8.00	13.19	9.25
77⅛	77¼	80½	60	64½	53	283,100	1,947,400	Cont. Can	No	1,420,000	5.00		7.21
...	...	126	124½	128	123	40	2,200	pfd.	100	51,125	7%		86.82
100½	99½	102½	82	94	64¾	207,700	908,200	Corn Products	25	2,530,000	2.00	9 mo. 3.00	3.50
...	...	144½	141	146¾	138½	930	8,410	pfd.	100	250,000	7%	9 mo. 35.63	42.40
53½	51½	69½	42½	68¾	34¾	62,600	944,300	Davison Chem.	No	480,000	...		6.21
51¾	51½	64½	43½	61	40	27,500	129,100	Devoe & Rayn A	No	110,000	2.40	6 mo. †5.95	†5.03
...	...	115½	112	120	108	90	1,460	1st pfd.	100	17,473	7%	6 mo. 34.71	53.23
115½	115¾	119	115½	121½	114	4,300	28,700	Dupont deb.	100	904,539	6%	9 mo. 57.79	57.03
185½	184	198½	155¼	503	310	72,900	601,400	Dupont de Nemours	No	2,661,658	*14.75	20.89	15.45
181¾	181	194½	168	194½	163	16,600	122,900	Eastman Kodak	No	2,057,560	*8.00		9.61
126½	126½	128	125½	132½	123½	340	1,620	pfd.	100	61,657	6%		326.68
240	240	310	215	230	120	200	6,400	Fed. Mining & Smelting	100	50,400	...		23.36
83⅜	82⅜	87⅛	65½	89⅜	65	1,011,700	2,299,200	Fleischmann	No	4,500,000	*5.00	9 mo. 3.24	4.30
48	47½	54½	37½	109½	43	71,900	505,100	Freeport Texas	No	729,844	4.00	4.49	5.12
82¼	81¾	87⅛	61	94⅜	141½	101,500	553,900	General Asphalt	100	206,887	...	6 mo. ...	4.74
...	...	131	104½	150	132	6,000	35,700	pfd.	100	68,742	5%	6 mo. d5.09	19.34
61⅛	60½	61⅛	36⅛	37	20⅛	224,300	926,800	Glidden Com.	No	500,000	*2.00	3.37	2.88
...	...	106½	101½	105	95	720	5,020	prior pfd.	100	69,167	7%	32.69	23.91
61½	60½	82	53½	143½	71	220,000	3,053,000	Gold Dust	No		2.50		8.97
...	...	79½	62	84	64½	8,000	63,900	Household Prod.	No	575,000	*4.00	6 mo. 2.64	5.22
8⅛	8⅛	17¼	8½	20⅛	13	23,400	102,400	Intern. Agri.	No	450,000			1.34
...	...	88½	67	85	48⅛	1,300	14,800	pfd.	100	100,000	7%		13.03
51⅞	51½	72¼	40½	46	41½	602,800	9,827,000	Intern. Nickel	No	1,673,384	3.00	9 mo. 4.72	3.30
48½	46½	63	43¼	60	47⅛	6,200	65,100	Int. Print Ink	No	256,022	2.50	6 mo. 2.58	4.98
...	...	90⅜	55½	69	49½	760	14,730	Intern. Salt	100	60,771	...	6 mo. 0.05	5.38
186½	183	242½	152½	202	96½	128,900	1,783,800	Johns-Manaville	No	750,000	3.00	9 mo. 4.94	4.78
91⅛	89	113⅛	71⅛	124½	63½	85,400	387,800	Liquid Carbonic Corp.	No	125,000	4.00	7.05	5.90
...	...	46	37	57½	45	4,200	31,700	Mac and Forbes	No	378,500	*3.50	9 mo. 2.34	3.62
56¼	56	58⅛	42½	190	117½	88,400	251,080	Mathieson Alk	No	147,207	6.00	9 mo. 9.54	10.93
...	...	125	120	130	115	100	2,590	pfd	100	24,750	7%	9 mo. 63.03	74.06
43½	43	54½	30½	33	17¾	78,000	1,295,300	Miami Copper	5	747,116	2.00		1.53
49½	48⅜	58	33	58½	29½	146,800	738,800	National Dist. Prod.	No	168,000	...		...
105½	105½	107½	67½	...	...	115,000	201,500	pfd. tem. ctfs.	...	...	...		...
151	151	173	132	136	115	6,200	13,3040	National Lead	100	309,831	5%		8.90
75	70⅜	75	43					Newport Co.	50	130,000			
58½	57¼	58½	38	41½	22⅜	36,600	454,400	Penick & Ford	No	433,773	...	9 mo. 1.32	1.76
301	300	304½	208	217	157	26,000	100,500	Peoples Gas Chi	100	511,521	8%	9 mo. 8.98	10.81
33½	32⅛	43½	27			324,400	1,106,300	Royal Baking, new com	100	800,000	1.00	6 mo. 0.53	1.14
107	107	110	95			3,700	5,000	pfd.	100	100,000	6%	6 mo. 7.26	15.11
68⅛	67½	94	62	71½	37	107,500	1,971,600	St Joseph Lead	10	1,950,509	*3.00		2.06
57⅛	57	62⅜	48	59⅜	37⅜	330,900	3,958,300	Standard Oil Co. of N. J.	25	24,419,219	*1.50		1.52
39½	39½	45½	38	45½	28⅛	105,500	3,572,500	Standard Oil Co. of N. Y.	25	17,118,931	1.60		0.67
17⅛	17½	20⅛	16	19¼	10¼	28,800	716,500	Tenn. Cop. & Chem.	No	794,626	1.00		0.51
70⅜	69⅜	85½	69⅛	82½	62½	121,400	2,656,800	Texas Gulf Sulfur	No	2,540,000	4.00	5.72	4.76
102⅛	100½	103⅛	75½	209	186½	581,500	2,130,300	Union Carbide	No	2,742,072	6.00	9 mo. 7.16	9.53
179½	178⅛	187	128	138	102½	138,000	873,100	U. S. Ind. Alc.	No	240,000	6.00	6 mo. 3.90	7.26
...	...	127	124½	125⅞	118⅛	...	860	pfd.	100	60,000	7%	6 mo. 19.12	36.03
89⅛	87⅛	116½	68	111½	60	129,900	1,203,700	Vanadium Corp.	No	376,637	*4.00	6 mo. 2.57	4.97
12⅛	11½	24¼	9½	20⅜	12	21,200	469,100	Virginia Car. com.	No	486,700	...	0.69	...
41½	40½	65½	36¼	64¼	44⅛	5,900	92,920	6% pfd.	100	213,392	...	7.57	d5.41
...	...	97½	86½	99½	88½	1,600	9,200	7% pfd.	100	125,000	7%	20.09	d1.70
								NEW YORK CURB					
...	...	23	6	31½	16½	1,200	9,700	Acetol Prod.	No	60,000	2.40		8.69
36	35½	43½	32	42⅜	33⅛	5,400	33,300	Agfa Ansco	No	300,000	...		
285½	285½	294	146	197½	120	6,900	60,000	Aluminum Co. of America	No	1,472,625	...		3.28
106	105	108½	103½	110½	104	2,000	14,800	pfd.	100	1,472,625	6%		9.28
...	...	...	...	87¼	74	...	92,600	Amer. Com. Alc.	No	77,000	...	3 mo. 2.66	...
54¼	53⅜	62½	39½	65	30⅛	161,400	650,700	Amer. Cyan.	20	428,465	8%	†3.67	†2.92
27	25	40½	25	28½	11⅛	3,800	128,200	Amer. Sol. & Chem. com.	No	160,000	...	1.58	0.07
46	40	55½	40	47⅛	25½	1,600	62,600	pfd.	No	100,000	...	6.52	3.17
39⅛	39⅛	45½	33	54	26½	12,200	129,600	Anglo Chile Nitrate	No	1,756,750	...	6 mo.. ...	...
...	...	10½	4⅛	33¾	7	12,800	94,000	Br. Celanese	No	2,650,000	...	0.55	...
				46½	41			Canad. Ind. Alc.	No	1,092,915	1.52	†2.87	†2.49
...	...	267	180	226	156	1,740	5,890	Casein Co.	100	21,196	*9%		7.98
32	32	57½	31	103	36½	3,600	90,500	Celanese Corp. of Am	No	1,000,000	...		1.72
54½	54	...	...	122	34	100	4,300	Celluloid Co.	No	194,952	...		0.87
107	103	110	100	132	103½	200	2,300	1st pfd.	No	23,882	7.00		11.94
				97½	75			7% pfd.	No	24,551	7.00		9.96
65½	65½	80½	63	92	75	3,100	41,300	Colgate-Palmolive Peet			2.00		
...	...	...	...	...	...	...	...	Courtaulds	£1	12,000,000	22½%		26.55%
...	...	25½	18½	24⅛	20	9,000	40,400	Am. dep-rects.	...	...	...		...

1929 June 29 High	1929 June 29 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In June	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
118	117¾	130	96¾	380	192	200	2,570	Hercules Powder	No	147,000	14%	22.04	16.35
...	...	121¾	115	125	118½	60	1,170	pfd	100	114,241	7%	9 mo. 24.69	28.02
...	...	41½	19½	23	7½	2,600	14,400	Heyden Chem.	10	150,000	...		1.0
...	...	27	16½	98	38½	200	1,700	Monroe Chem.					
155	145	...	...	...	...	275	1,225	Monsanto Chem.	No	110,000	2.50	9 mo. 6.30	6.11
				...	...			Penn Salt	50	150,000	5.00	8.27	8.09
...	...	9½	7	9¾	6½	9,200	37,600	Pyrene Mfg.	10	219,470	.80		0.70
...	...	105¾	81	...	...	150	5,150	Sherwin Williams	20	594,445	4.00	6.99	6.42
37½	36½	48½	23½	111½	103	15,700	429,600	Silica Gel	No	600,000	...		
				92	65½			Snia Viscosa	120 lire	8,333,333	...		3 01 lire
...	...	...	...	29	17	200	200	dep-recpts	...	...	...		...
				9¾	6½			Spencer Kellogg	No	500,000	1.60	3.59	2.37
...	...	139½	124½	10	5½	2,200	22,500	Swift & Co.	100	1,500,000	8%	9.87	8.13
325	305	550	305	42	31½	1,190	13,495	Tubize "B"	No	78,858	10.00		
38½	38	61½	34½	150½	125	9,300	60,400	United Chem., pfd.	50	120,000	3.00		
...	...	...	...	630	450	140	187,740	com.	No	102,000			
68½	68½	75½	56	100	53¾	9,600	221,600	U. S. Gypsum	20	691,502	1.60	6 mo. 4.42	10.08
...	...	...	...	...	...		21,500	Westvaco Chlorine Prod.	No	200,000	2.00	3.60	
								CLEVELAND					
...	...	98½	97	147½	104	8,341	15,306	Cleve-Cliff Iron	No	400,000	4.00		9.74
...	...	295	200	225	112½	43	734	Dow Chem.	No	120,000	6.00		
...	...	107½	104½	107	103¾	55	316	pfd.	100	30,000	7%		
				...	...			Glidden	No	500,000	*2.00	3.37	2.88
103	103	105	102½	104¾	96	881	2,307	prior pfd.	100	69,167	7%	32.69	23.91
94	94	105	82	95	65½	435	12,500	Sherwin Williams	25	594,445	4.00	6.99	6.42
105	105	108	104½	109½	106	513	3,600	pfd.	100	125,000	6%	39.21	37.82
...	...	29	25	28	24¾	113	1,700	Wood Chemical Prod. "A"	No	20,000	2.00		7.75
								CHICAGO					
...	...	61	36	96	91½	810	18,500	Monroe Chem	100	167,500	...		4.74
151	150	160	104	146	127½	4,850	42,877	Monsanto Chem.	No	148,000	2.50	9 mo. 6.30	8.58
125½	124½	140	124½	...	..	4,850	32,850	Swift & Co.	100	1,500,000	8%	9.87	8.13
68¼	68½	75½	45¾	...	...	33,400	180,000	U. S. Gypsum	20	691,502	1.60	6 mo. 4.42	10.08
...	...	...	...	100	55	100	53,450	United Chemicals, pfd.	50	120,000	3.00		
								CINCINNATI					
...	...	129½	129½	...	...	168	287	Fleishmann pfd.	100	12,200	6%	9 mo. 1,197.09	1,589.49
380	380	390	279	300	249	2,848	23,848	Proc. & Gam.	20	1,250,000	8.00	11.96	11.38
								PHILADELPHIA					
...	...	...	...	109½	92	800	6,900	Penn. Salt	50	150,000	5.00	8.27	8.09
241¼	237¼	247	157	173½	114¼	237,635	1,736,720	United Gas Imp.	50	3,900,791	6.00		6.28
								MONTREAL					
10	10	...	...	...	...	2,255	32,500	Asbestos Corp.	No	200,000	...		0.87
...	...	...	...	...	...	846	8,500	pfd.	100	74,564	7%		9.32
24½	21½	...	...	..	...	6,518	148,000	Canada Ind. Alc.	No	1,092,915	1.52	†2.87	†2.49
83½	82½			...	...	28,337	263,700	Shawinigan W. & P.	No	1,844,700	2.00		2.41
								BALTIMORE					
...	...	...	...	28¼	17	100	5,200	Silica Gel	No	600,000	...		
Bid	**Asked**							UNLISTED					
				80	70			Agfa Ansco, pfd.	100	50,500	...		...
118	114	...	...	375	190			Hercules Powd., com.	No	147,000	14%	9 mo. 15.10	16.36
73	67	...	...	82	64			Merck. & Co., pfd.	100	33,950	...		...
				169	116			Newport	1	929,498	...		0.19

*Includes extra dividends. †Class A and class B shares combined. d Deficit.

The Industry's Bonds

1929 June 29 High	1929 June 29 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In June	Sales Since Jan. 1	ISSUE	Date Due	Int. %	Int. Period	Orig. (1) Offering $
								NEW YORK STOCK EXCHANGE				
105	105	106½	103½	106¾	104	95	617	Am. Agri Chem.	1941	7½	F. A.	30,000
...	...	96½	93¼	97	92	68	787	Amer. Cyanid	1942	5	A. O.	
101	100⅝	102	98¼	102¾	99¾	253	1,758	Am. Smelt & Refin "A" 5%	1947	5	A. O.	...
...	...	100	93½	105½	92	241	1,992	Anglo Chilean	1945	7	M. N.	16,500
100⅝	100⅜	102½	100	103¾	99¾	180	723	Atlantic Refin.	1937	5	J. J.	15,000
...	...	102	100	103½	100	28	165	By product Coke	1945	5½	M. N.	8,000
...	...	103	96½	103½	100	23	59	Corn Product Refin.	1934	5	M. N.	10,000
...	...	109½	103	117	106	30	342	General Asphalt	1939	6	A. O.	5,000
...	...	95	90½	95¾	89½	2	111	Int. Agric. Corp.	1932	5	M. N.	30,000
...	...	81½	76¾	86¼	77	14	78	Int. Agri. Corp. stamped extended	1942	5	M. N.	7,020
...	...	127	107	...	...	16	1,174	Montecatini	1937	7	J. J.	
...	...	98¾	93	...	...	48	1,312	Ex War	1937	7	J. J.	
...	...	113	110	...	...	5	62	People's Gas & Coke	1943	6	A. O.	10,000
...	...	105¾	101	108½	102	31	317	Refunding	1947	5	M. S.	40,000
101	100½	103¾	100½	104	102	432	2,623	Standard Oil N. J.	1946	5	F. A.	120,000
...	...	115	102	120	101½	2	532	Tenn. Cop. and Chem.	1941	6	A. O.	3,000
...	...	82	70	91¼	82	10	100	Va. Iron C. & C.	1949	5	M. S.	
								NEW YORK CURB				
100¼	100½	102½	100	103½	100	259	1,764	Alum. Co. of Am 52	1952	5	M. S.	
				121½	98			Amer. Com. Alc.	1943	5	M. N.	
...	...	122	104	125	99	4	1,349	Amer. Solv. & Chem.	1936	6	M. S.	
95¾	95½	100½	95½	101¾	97½	174	1,648	Koppers Gas and Coke	1947	5	J. D.	25,000
...	...	103	98½	103½	98	82	248	Natl. Dist. Prod.	1935	6½	J. D. 15	3,500
...	...	94¼	90½	98¾	93½	115	983	Shawinigan W & P	1967	4½	A. O.	
...	...			106¾	100	4	222	Silica Gel. 6½% with warr.	1952	6½		
...	...	98¾	94½	100	95	24	240	Solvay Am. Invest. Corp.	1942	5	M. S.	15,00
99½	99	100½	98¾	101½	99¾	221	1,600	Swift & Co.	1932	5	A. O.	50,00
...	...	...	...	104	99½	17	299	Westvaco Chlorine Prod.	1937	5½	M. S.	2,50

Germany's Lacquer Production Valued at 300,000,000 Marks

Value of lacquer production in Germany amounts from 250,000,000 to 300,000,000 marks annually from raw materials costing 150,000,000 marks, and that exports increased in value from 13,000,000 marks in 1913 to 28,000,000 marks in 1928, according to reports at a meeting of the Association of Lacquer Manufacturers, Berlin.

The association stated in answer to an appeal of consumers for a reduction of price in lacquers that the industry was completely nationalized and that a further decrease in price would affect the quality. In regard to standardizing the composition of lacquers, the association concluded that this practice would deter technical progress of the industry.

Referring to complaints raised by lacquer producers as to competition caused by the German Dye Cartel in producing synthetic finished lacquers, it was suggested that the ideal solution of the matter would be for the German lacquer industry proper to cooperate with the dye cartel. (Mark par $2.238.)

Chilean Nitrate Producers Offer British Dealers Price Protection

Chilian Nitrate of Soda Producers' Association offers British dealers the benefits of a scheme of price protection on stocks carried forward unsold on June 30, 1929. Dealers who wish to participate are invited to apply to the Delegation for Great Britain and Ireland of the Association, Friars House, New Broad Street, London, E. C. 2, to be placed on the list of "approved dealers." Subject to various obligations being faithfully executed, an "approved dealer" shall be entitled to claim, under certain specified conditions, from the delegation an indemnity on stocks of Chilean nitrate held by him unsold and his own property on June 30, 1929. The scheme applies also to stocks held by industrial users of Chilean nitrate of soda.

Production of all types of rayon yarn in the United States during 1930 will approximate 175,750,000 pounds. This represents a gain of about 45,000,000 pounds over the planned production for 1929 of 130,450,000 pounds, about 78,000,000 pounds more than 1928 and considerably more than twice that of 75,522,000 pounds for 1927. Total production, according to production methods, is divided as follows: viscose process, 147,650,000 pounds; cellulose acetate, 13,600,000; nitro-cellulose, 9,500,000, and cuprammonium, 5,000,000, according to the *Daily News Record.*

Stating that it has found a cheaper and better process for producing alcohol from wood and wood-waste, Brennereiund-Iresshefefabrik Tornesch G.m.b.H., in Tornesch-bei-Hamburg, appealed recently to the Reichsrat (federal council) for permission to go into production. The federal council granted owners of the new process permission to produce 35,000 hectoliters annually by the process, according to the Department of Commerce.

Alsatian potash production during January established a new high level. The previous record was October, 1928, with 256,000 tons. January's figure, however, was 271,500 tons, composed of 216,000 tons of 12-16 per cent. sylvinit, 70,250 tons of 20-25 per cent. sylvinit, 13,750 tons of 30-40 per cent. chloride and 34,500 tons of 50-60 per cent. chloride, the whole having a pure potash content of 42,400 tons.

Average daily production at the French State Nitrogen Factory at Toulouse was 20 tons of ammonia in November, 28 tons in December and 30 tons in January. A Haber ammonia synthesis unit has been ordered from Germany on reparations account at a cost stated to be 16⅛ millions francs. The Habeo unit will work parallel with the Casale unit now operating.

Direct Production of Citric Acid From Lemon Juice Reported

Citric acid from lemon juice and similar raw materials without the intermediate production of citrate of lime, has been worked out by Professor Dr. C. Crotto of the School of Pharmacy in Buenos Aires ("Quimica e Industria," May, 1929). In outline the process is as follows:—The lemon juice is concentrated in vacuo to the consistency of a semi-solid and is then macerated with acetone, the weight of acetone used being double that of the concentrated juice. The albuminous, pectic, mucilaginous and other insoluble substances are separated by filtration and the filtrate treated with half of its weight of distilled water. The citric acid dissolves in the water and the acetone is separated and recovered. The process is patented (Argentine Patent No. 14,106) and is stated to give perfectly satisfactory results on the semi-large scale.

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The Trend of Prices

High Level of Production and Distribution Continues in June

Month is Marked by Many Mergers in Chemical Industry—Alkalis Continue to Set New High Records—Alcohol Well Sold Up—Interest Centers About Natural-Synthetic Nitrate Merger and Effect Upon Fertilizer Prices.

The high level of production and distribution of commodities characterizing business conditions in April was maintained throughout May and the early days of June. A further increase in May of factory pay rolls and employment was noted.

Production and distribution of commodities continued at a high rate in May. Wholesale commodity prices declined further during the month, but more recently showed some advance. Total loans and investments of member banks in leading cities have increased since the latter part of May.

Industrial production continued large in May and was accompanied by a further increase in the volume of factory employment and pay rolls.

Output of the iron and steel industry increased further, and shipments of iron ore during May were the largest for that month of any recent year; production of pig iron, steel ingots, and coke was at record levels; and semi-finished and finished steel was produced in large volume. During the first half of June steel operations remained close to capacity, although some decline from the high rate of May was reported.

Output of automobiles, which has been in unusually large volume since the beginning of the year, showed a slight reduction in May.

Output in the textile industries continued large in May although there was a decline in activity in silk mills. Meat production, while larger than in April, increased less than is usual at this season.

The volume of freight shipments increased seasonally in May and continued substantially above the total of a year ago.

Wholesale prices continued in May the downward movement of the previous month, according to the index of the Bureau of Labor statistics. The decline of the general level was chiefly the result of price declines in agricultural products and their manufactures, although prices of other products also declined slightly.

Prices of cotton and grains continued sharply downward in May and there were marked declines in the prices of hogs, wool, and lambs. Prices of mineral and forest products and their manufacturers averaged lower in May than in April, particularly those of copper, lead, and tin; petroleum and gasoline, and iron and steel advanced in price; while in lumber there was a slight decline.

Since the latter part of May prices of cattle and hides have advanced sharply and there have been increases in the prices of grains, hogs and cotton.

Total loans and investments of member banks in leading cities, which were at a low point for the year in the latter part of May, increased considerably during the subsequent three weeks and on June 19 were about $250,000,000 larger than a year ago.

The recent increase reflected a large growth in the volume of loans on securities, which had declined during the preceding two months, and a further growth in loans chiefly for commercial and agricultural purposes. Investments declined during most of the period and on June 19 were at a level about $450,000,000 below that of the middle of last year.

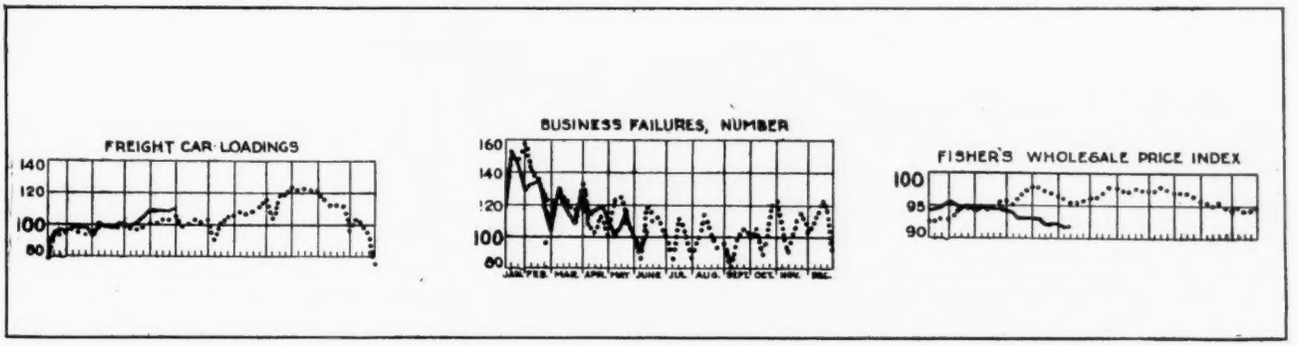
Volume of reserve bank credit outstanding, after increasing in the latter part of May, declined in June and, following the Treasury financial operations around the middle of the month, showed a small increase for the four weeks ended June 19.

Open market rates on collateral loans declined in June, while rates on prime commercial paper and 90-day bankers' acceptances remained unchanged.

The outstanding feature of the past month in the chemical industry has been the great number of mergers. June might well be termed the month of mergers for there was American-Cyanamid-Kalbfleisch, Newport-Rhodia, U. S. Industrial Alcohol-Kentucky Alcohol, Monsanto-Rubber Service Laboratories, and Calco-King.

As concerns the market, the alkali group are pushing on to set a new record. Every month this year has surpassed each previous month and even the most optimistic forecasts have been surpassed. The first six months of this year have surpassed any similar period with the exception of the heyday of the war-time period. Sulfuric and the mineral acids generally continue in excellent demand while alcohol producers say that they are approaching an oversold condition.

In the fertilizer group, the center of the stage is held by the nitrates. Added to the new Anglo-Chilean, Lautaro combination of interests has come the announcement from abroad that the I. G. and the Chilean nitrate interests have come to a working agreement. The new nitrate prices have been announced, and domestic prices, beginning July 15 go on the basis of $2.10 per 100 lbs. Prices outside of the United States are reported to be about six per cent lower than during the past season. Ammonium sulfate prices have also been announced at lower than last year's level.



Business indicators prepared by the Department of Commerce. The weekly average 1923-1925 inclusive = 100. The solid line represents 1929 and the dotted line 1928.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

Acetone — Demand continues to hold up very well at all points and prices remain firm. Although still in an experimental stage, the possibilities of the use of this material in the extracting of paraffin waxes as part of the oil refining process points the way to a big potential market. The patent on a process of this sort is at present held by one of the independent oil companies, but practically every oil producer is said to be experimenting with it.

Acid Acetic — A somewhat easier tendency has been noticeable during the past month due chiefly to a slackened demand from solvent producers. This respite was welcomed by producers as offering an opportunity to catch up with the demand.

Acid Boric — Has been in good demand with prices firmly maintained by producers.

Acid Formic — In some cases this acid has been used in place of acetic as supplies of the latter have been rather scarce. Consequently demand has been good and considerable imported material has been in evidence.

Acid Lactic — Here too, there has been some effort to use this material as a substitute for acetic acid, but demand has not been heavy due to some curtailment of textile activities.

Acid Muriatic — Demand continues to be very heavy for this material and producers are busy keeping deliveries up to schedule.

Acid Oxalic — Producers are said to be two weeks or more behind schedule on this material, with but very little stock on hand. This has been the great consuming season and the market is very strong with prices firmly held.

Acid Sulfuric — That industry generally is in good condition is evidenced by the continued heavy demand for this and other members of the mineral acid group.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.26	.18½	.24	.24	Acetaldehyde, drs lc-1 wks...lb.	.18½	.21	.21	.18½
				Acetaldol, 50 gal dr.....lb.	.27	.31	.31	.27
.24	.23	.20	.20	Acetanilid, tech, 150 lb bbl...lb.	.23	.24	.24	.23
				Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.29	.35	.35	.29
.35	.29	.29	.29	Acetin, tech drums.....lb.	.30	.32	.32	.30
.....	.....	.38	.32	Acetone, CP, 700 lb drums c-l wks.....lb.	.....	.15	.15	.15
.15	.13	.....	.....	Acetone Oil, bbls NY.....gal.	1.15	1.25	1.25	1.15
.15	.13	.12	.12	Acetyl Chloride, 100 lb cby...lb.	.55	.68	.68	.45
1.75	1.65	1.65	1.65	Acetylene Tetrachloride (see tetrachlorethane).....				
.45	.42	.42	.42					
				Acids				
				Acid Acetic, 28% 400 lb bbls c-l wks.....100 lb.	.....	3.88	3.88	3.88
3.88	3.38	3.38	3.38	Glacial, bbl c-l wk.....100 lb.	.....	13.68	13.68	13.68
13.68	11.92	11.92	11.92	Anthranilic, refd, bbls.....lb.	.98	1.00	1.00	.98
1.00	.98	.98	.98	Technical, bbls.....lb.	.....	.80	.80	.80
.80	.80	.80	.80	Battery, cbys.....100 lb.	1.60	2.25	2.25	1.60
2.25	1.60	1.60	1.25	Benzoic, tech, 100 lb bbls....lb.	.57	.60	.60	.57
.60	.57	.57	.57	Boric, crys. powd, 250 lb bbls.....lb.	.05¾	.06¼	.06¼	.05¾
.11	.08½	.08½	.08½	Broenner's, bbls.....lb.	.....	1.25	1.25	1.25
1.25	1.25	1.25	1.25	Butyric, 100% basis cbys.....lb	.85	.90	.90	.85
.90	.85	.85	.80	Camphoric.....lb.	.....	4.85	4.85	4.85
4.85	4.85	4.90	4.85	Carbolic, 10%, 50 gal bbls....lb.	.13	.14	.14	.13
.28	.13	.25	.25	Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.05½	.04½
.16	.15	.15	.15	Chromic, 99%, drs extra.....lb.	.19	.21	.23	.19
.30	.25	.37	.25	Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.06	1.00
1.06	1.00	1.00	1.00	Citric, USP, crystals, 230 lb. bbls.....lb.	.46	.59		.46
.44½	.59	.44½	.43	Cleve's, 250 lb bbls.....lb.	.52	.54	.59	.52
.97	.95	.95	.95	Cresylic, 95%, dark drs NY..gal.	.60	.70	.54	.60
.70	.68	.60	.57	97-99%, pale drs NY.....gal.	.72	.77	.77	.72
.72	.72	.70	.60	Formic, tech 90%, 140 lb. cby.....lb.	.10½	.11½	.11½	.10½
.12	.11	.11	.10	Gallic, tech, bbls.....lb.	.50	.55	.12	.50
.55	.50	.50	.50	USP, bbls.....lb.	.....	.74	.55	.74
.74	.74	.74	.69	Gamma, 225 lb bbls wks.....lb.	.80	.85	.74	.74
1.06	1.00	1.00	1.00	H, 225 lb bbls wks.....lb.	.68	.72	.99	.80
.63	.57	.57	.57	Hydriodic, USP, 10% soln cby lb.	.....	.67	.72	.67
.67	.67	.67	.65	Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.67 .48	.45
.48	.45	.45	.45	Hydrochloric, CP, see Acid Muriatic.....			.....	.....
.90	.80	.80	.80	Hydrocyanic, cylinders wks...lb.	.80	.90	.90	.80
.06	.06	.06	.06	Hydrofluoric, 30%, 400 lb bbls wks.....lb.	.....	.06	.06	.06
.11	.11	.11	.11	Hydrofluosilicic, 35%, 400 lb bbls wks.....lb.	.....	.11	.11	.11
.85	.85	.85	.85	Hypophosphorous, 30%, USP, demijohns.....lb.	....	.85	.85	.85
.06	.04½	.05½	.05½	Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.05½	.04½
.13½	.12	.13	.13	44%, light, 500 lb bbls..... lb.	.11	.11½	.12½	.11
.54	.52	.52	.52	Laurent's, 250 lb bbls.....lb.	.40	.42	.42	.40
.60	.48	.....	.....	Malic, powd., kegs.....lb.	.48	.60	.60	.48
.65	.60	.60	.60	Metanilic, 250 lb bbls.....lb.	.60	.65	.65	.60
.08	.07½	.07¾	.07½	Mixed Sulfuric-Nitric..... tanks wks.....N unit	.07	.07½	.07½	.07
.01½	.01	.01	.01	tanks wks.....S unit	.008	.01	.01	.008
.21	.18	.21	.18	Monochloroacetic, tech bbl..lb.	.18	.21	.21	.18
.65	.65	1.65	1.65	Monosulfonic, bbls.....lb.	1.65	1.70	1.70	1.65
1.40	1.35	1.35	1.35	Muriatic, 18 deg, 120 lb cbys c-l wks.....100 lb.	.....	1.35	1.40	1.35
				tanks, wks. 100 lb.		1.00	1.00	1.00
1.80	1.70	1.70	1.70	20 degrees, cbys wks...100 lb.	.....	1.45	.....	1.45
.95	85	.95	.95	N & W, 250 lb bbls.....	.85	.95	.95	.85
.59	.55	.55	.55	Naphthionic, tech, 250 lb.....	.....	Nom.	.59	.55
5.00	5.00	5.00	5.00	Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	.....	5.00	5.00	5.00
6 00	6.00	6.00	6.00	40 deg, 135 lb cbys, c-l wks.....100 lb.	.....	6.00	6.00	6.00
.11½	.10½	.11½	.11	Oxalic, 300 lb bbls wks NY...lb.	.11	.11½	.11½	.11
.08½	.08	.08	.07	Phosphoric 50%, 150 lb cby..lb.	.08	.08½	.08½	.08
.16	.16	.19	16	Syrupy, USP, 70 lb drs....lb.	.....	.16	.16	.16
.50	.50	.50	.50	Picramic, 300 lb bbls.....lb.	.65	.70	.70	.65
.50	.40	.45	.30	Picric, kegs.....lb.	.40	.50	.50	.40
.86	.86	.86	.86	Pyrogalic, technical, 200 lb bbls.....lb.	.....	.86	.86	.86
.32	.27	.27	.27	Salicylic, tech, 125 lb bbl.....lb.	.37	.42	.42	.37
.16	.15	.15	.15	Sulfanilic, 250 lb bbls.....lb.	.15	.16	.16	.15
1.95	1.60	1.60	1.60	Sulfuric, 66 deg, 180 lb cbys lc-1 wks.....100 lb.	1.60	1.95	1.95	1.60
				tanks, wks. ton		15.50	15.50	15.50
1.37½	1.20	1.20	1.20	1500 lb dr wks.....100 lb.	1.50	1.65	1.65	1.50
1.12½	1.12½	1.10	1.10	60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.42½	1.27½
1.52½	1.52½	1.50	1.50	Oleum, 20%, 1500 lb. drs lc-1 wks ....100 lb.	.....	1.52½	1.52½	1.52½

News Notes

"Over a Century of Service and Progress"

1816 JULY, 1929 1929

Acetic Acid:

We are very well placed to supply this material from spot stocks maintained at all times. We have the various strengths . . . 28%, 56%, 70%, 80% and Glacial. Our prices are in line with market conditions, and quality is second to none.

Carbonate of Ammonia:

We have constant arrivals of the Prime English quality, both lump and powdered . . . packed in convenient drums and barrels. The quality and test of this material knows no superior. Spot stocks are maintained in warehouse at New York.

Barium Hydrate:

This is an article of increasing importance in our line of products. It is imported by us from one of the best known German makers whom we represent. It is a nice dry, free running crystal of highest quality . . . packed in strong barrels, and is available at all times for immediate delivery.

Mirbane Oil:

We represent a well known American maker, and have a large sale for this product. It is a refined Oil of light amber color, and is meeting with great favor with the trade.

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This is often known as Iron Perchloride. It is C. P. . . . in quality in a dry lump form . . . packed in strong uniform weight barrels. We have constant arrivals and maintain ample stocks.

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

Albumen — The light grade of blood albumen continues at 43c @ 47c lb., while the dark is quoted at 12c @ 20c lb. Edible egg albumen may be obtained as low as 75c lb. and ranges to 80c lb. depending upon seller and quantity.

Alcohol — Is reported to be in very good position and approaching an oversold condition. Contracts have come in in large volume since the price announcement and everything points to a very good year. A feature of the past month has been the merger of two of the larger factors in the field. As an indication of the rapidity with which consumers have covered their requirements, it is estimated that approximately 75 per cent. of the anti-freeze trade have already contracted for their needs. Production of ethyl alcohol during May by members of the Industrial Alcohol Institute, Inc., increased 34 per cent. over the same month last year. The output totaled 7,274,299 wine gallons, as compared with 5,417,278 gallons during May, 1928. Last month's ethyl production also was an increase of three per cent over April, when the output amounted to 7,049,009 gallons. Combined inventories of all reporting members, including stocks of ethyl, C. D. and S. D. alcohol, at the close of May totaled 17, 125,037 gallons, as compared with a total inventory of 15,075,348 gallons at the close of April, or an increase of 2,049,689 gallons, equivalent to 13½ per cent. The inventory position of alcohol in detail, compared with the previous month, follows:

	1929	
	May 31	*April 30*
Ethyl alcohol....	7,170,893	6,694,782
C. D. alcohol.....	8,876,670	7,315,123
S. D. alcohol.....	1,077,474	1,065,443
Aggregate stocks of all members, 1929	17,125,037	15,075,348

Stocks of all three grades of alcohol at the end of last May also were higher than those reported for either April or May last year, as the following figures for 1928 discloses:

	1928	
Ethyl alcohol....	6,292,934	6,925,493
C. D. alcohol....	6,938,623	6,187,564
S. D. alcohol.....	796,656	833,142
Aggregate stocks of all members, 1928	14,028,213	13,946,199

As compared with the previous year, the combined stocks at the close of May last show an increase of 3,096,824 gallons, or 22 per cent. At the end of April, 1929, stocks totaled 15,075,348 wine gallons, as compared with 13,946,199 wine gallons at

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
42.00	42.00	42.00	42.00	40%, 1c-1 wks net ..... ton	.....	42.90	42.00	42.00
.40	.30	.30	.30	Tannic, tech, 300 lb bbls..lb.	.30	.40	.40	.30
				Tartaric, USP, crys, powd,				
.38	.34½	.37	.29½	300 lb. bbls.....lb.	.38	.38½	.38½	.38
.85	.85	.85	.85	Tobias, 250 lb bbls .....lb.	.....	.85	.85	.85
2.75	2.75	2.75	2.00	Trichloroacetic bottles.....lb.	.....	2.75	2.75	2.75
2.00	2.00	2.00	2.00	Kegs.....lb.	.....	2.00	2.00	2.00
1.25	1.00	1.00	1.00	Tungstic, bbls.....lb.	1.79	2.10	2.10	1.00
.55	.43	.45	.45	Albumen, blood, 225 lb bbls..lb.	.43	.47	.47	.43
				dark, ...bbls., lb.	.12	.20	.20	.12
.84	.78	.95	.80	Egg, edible.....lb.	.75	.80	.83	.70
.80	.70	.92	.77	Technical, 200 lb cases ..lb.	.70	.75	.80	.70
.65	.60	.60	.60	Vegetable, edible.....lb.	.60	65	.65	.60
.55	.50	.50	.50	Technical.....lb.	.50	.55	.55	.50
				Alcohol				
				Alcohol Butyl, Normal, 50 gal				
.20	.18½	.20	.19	drs c-1 wks.....lb.	.....	.1775	.17½	.17½
.19½	.18½	.20½	.19½	Drums, 1-c-1 wks.....lb.	.....	.1825	.18½	.18½
.19	.17½	.19½	.18½	Tank cars wks.....lb.	.....	.1725	.17½	.17½
				Amyl (from pentane)				
2.25	1.75	.....	.....	drs c-1 wks.....gal.	.....	1.67	1.67	1.67
1.80	1.70	1.70	1.70	Diacetone, 50 gal drs del..gal.	1.70	1.80	1.80	1.70
				Ethyl, USP, 190 pf, 50 gal				
3.70	2.65	3.70	3.70	bbls.....gal.	.....	2.69½	2.69½	2.69½
.55	.50	.50	.50	Anhydrous, drums.....gal.	.....	.71	.71	.71
				Completely denatured, No. 1,				
.52	.48½	.52	.37½	190 pf, 50 gal drs drums extra.....gal.	.....	.51	.51	.49
				No. 5, 188 pf, 50 gal drs.				
.50	.43	.50	.29	drums extra.....gal.	.....	.50	.50	.48
.46	.41	.46	.25	Tank, cars.....gal.	.....	.48	.48	.46
1.25	1.00	1.00	1.00	Isopropyl, ref, gal drs.....gal.	1.00	1.25	1.25	1.00
1.00	1.00	1.00	1.00	Propyl Normal, 50 gal dr..gal.	.....	1.00	1.00	1.00
.82	.80	.80	.80	Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.82	.80
				Alpha-Naphthol, crude, 300 lb				
.65	.65	.65	.65	bbls.....lb.	.....	.65	.65	.65
				Alpha-Naphthylamine, 350 lb				
.37	.35	.35	.35	bbls.....lb.	.32	.34	.34	.32
				Alum Ammonia, lump, 400 lb				
3.30	3.25	3.25	3.15	bbls, 1c-1 wks.....100 lb.	3.25	3.30	3.30	3.25
				Chrome, 500 lb casks, wks				
5.50	5.25	5.25	5.25	.....100 lb.	5.25	5.50	5.50	5.25
				Potash, lump, 400 lb casks				
3.20	3.10	3.50	3.10	wks.....100 lb.	3.00	3.10	3.20	3.00
				Chrome, 500 lb casks wks				
5.50	5.25	5.25	5.25	.....100 lb.	5.25	5.50	5.50	5.25
				Soda, ground, 400 lb bbls				
3.75	3.75	3.75	3.75	wks.....100 lb.	.....	3.75	3.75	3.75
26.00	24.30	27.00	26.00	Aluminum Metal, c-1 NY..100 lb.	.....	24 30	24.30	24.30
				Chloride Anhydrous, 275 lb				
.40	.35	.35	.35	drums.....lb.	.35	.40	.40	.35
				Hydrate, 96%, light, 90 lb				
.18	.17	.17	.17	bbls.....lb.	.17	.18	.18	.17
.24	.18	.22	.23	Stearate, 100 lb bbls.....lb.	.25	.26	.26	.25
				Sulfate, Iron, free, bags c-1				
1.75	1.75	1.75	1.75	wks.....100 lb.	1.95	2.05	2.05	1.95
1.40	1.40	1.40	1.35	Coml, bags c-1 wks..100 lb.	.....	1.40	1.40	1.40
1.15	1.15	1.15	1.15	Aminoazobenzene, 110 lb kegs lb.	.....	1.15	1.15	1.15
				Ammonium				
.14	.13½	.13½	.10	Ammonia, anhyd, 100 lb cyl..lb.	.14	.14	.14	.14
.03	.03	.03	.02½	Water, 26°, 800 lb dr del..lb.	.....	.03½	.03½	.03½
				Bicarbonate, bbls., f.o.b. plant				
				.....100 lb.	.....	5.15	6.50	5.15
.22	.21	.21	.21	Bifluoride, 300 lb bbls.....lb.	.21	.22	.22	.21
.09	.08½	.08½	.08½	Carbonate, tech, 500 lb cs..lb.	.09	.12	.12	.09
				Chloride, white, 100 lb. bbls				
5.15	4.45	5.05	4.85	wks.....100 lb.	4.45	5.15	5.15	4.45
5.75	5.25	.07	.05½	Gray, 250 lb bbls wks....lb.	5.25	5.75	5.75	5.25
.11½	.11	.11	.11	Lump, 500 lb cks spot...lb.	.11	.11½	.11½	.11
.16	.15	.15	.15	Lactate, 500 lb bbls.....lb.	.15	.16	.16	.15
.10	.06	.06	.06	Nitrate, tech, casks.....lb.	.06	.10	.10	.06
.38	.27½	.27½	.27½	Persulfate, 112 lb kegs.....lb.	.31	.34	.34	.31
				Phosphate, tech, powd, 325 lb				
.18	.18	.18	.18	bbls.....lb.	.12½	.13	.13	.12½
2.90	2.20	2.30	2.55	Sulfate, bulk c-1.....100 lb.	.....	2.20	2.40	2.20
3.00	2.50	2.55	2.35	Southern points.....100 lb.	.....	2.20	2.45	2.20
				Nitrate, 26% nitrogen				
				31.6% ammonia imported				
60.85	60.85	59.70	56.85	bags.....ton	.....	60.85	60.85	60.85
.60	.55	.55	.55	Sulfocyanide, kegs.....lb.	.36	.48	.48	.36
				Amyl Acetate, (from pentane)				
2.25	1.72	2.25	1.90	drs.....gal.	1.60	1.70	1.70	1.60
.....	.....	.....	.....	Tech., drs.....gal.	1.60	1.70	1.70	1 60
				Alcohol, see Fusel Oil.....				
				Furoate, 1 lb tins.....lb.		5.00		
.16½	.15½	.15¾	.15	Aniline Oil, 960 lb drs.....lb.	.15½	.16½	.16½	.15½
.48	.41	.41	.41	Annatto, fine.....lb.	.34	.37	.37	.34
				Anthraquinone, sublimed, 125 lb				
1.00	.90	.90	.90	bbls.....lb.	.80	.90	.90	.80
				Antimony, metal slabs, ton lots				
.12	.09½	.11½	.14	.....lb.	.....	.08¾	.10	.08¾
.12	.10	.15½	.14	Needle, powd, 100 lb cs....lb.	.....	.09	.10	.09
				Chloride, soln (butter of)				
.18	.17	.17	.17	cbys.....lb.	.17	.18	.18	.17
.12	.09½	.16½	.16½	Oxide, 500 lb bbls.....lb.	.09	.09½	.10	.09
.....	.....	.28	.25½	Salt, 66%, tins.....lb.	.25½	.26	.26	.25½
.20	.16	.20	.16	Sulfuret, golden, bbls.....lb.	.16	.20	.20	.16
.42	.38	.42	.37½	Vermilion, bbls.....lb.	.38	.42	.42	.38
.19	.17	.18	.18	Archil, conc, 600 lb bbls.....lb.	.17	.19	.19	.17
.14	.12	.12	.12	Double, 600 lb bbls.....lb.	.12	.14	.14	.12
.16	.15	.16	.14	Triple, 600 lb bbls.....lb.	.15	.16	.16	.15
.08	.08	.15	.12½	Argols, 80%, casks.....lb.	.. ..	.08	.08	.08
.16	.15	.08	.03	Coude, 30%, casks.....lb.	.15	.16	.16	.15
.11	.10½	.10½	.10½	Arsenic, Red, 224 lb kegs, cs..lb.	.09	.11	.11	.09
.04	.03¾	.04	.03¼	White, 112 lb kegs.....lb.	.04	.04¼	.04¼	.04
14.75	14.75	14.75	14.75	Asbestine, c-1 wks.....ton	.....	15.00	15.00	4.75

2 Interesting Chlorinated Solvents

Ethylene Dichloride • Dichlor Ethyl Ether

THE PROPERTIES of these two compounds are in general quite similar except for volatility and boiling range. Both are excellent solvents for fats and oils, insoluble in water, practically non-inflammable and non-corrosive. Both products have found general uses in similar fields and the wide difference in boiling points (Ethylene Dichloride 83°C, Dichlor Ethyl Ether 178°C) makes it possible to obtain the same characteristics in a quickly volatile solvent on one hand or a slowly evaporating solvent on the other. A few of the outstanding uses are set forth below.

TEXTILE INDUSTRY

Both solvents are excellently suited for the removal of tar and paint spots from fabrics or yarns. Dichlor Ethyl Ether, although somewhat slower in action, is often preferred because of its high boiling point which permits it to remain in textiles through several stages of a process, which is in some instances desirable. Ethylene Dichloride and Dichlor Ethyl Ether have both proved highly successful as solvents in soaps used in scouring, fulling and wetting out.

FUMIGATION

Ethylene Dichloride is an effective fumigant and insecticide. This has led to its wide use for the commercial fumigation of furniture, grain and flour. It is not dangerous to human life and is highly efficient, particularly when used in connection with a fumigation vault.

DRY CLEANING

In general, Ethylene Dichloride is preferable for household purposes because of its greater volatility. A non-inflammable mixture containing a small percentage of carbon tetrachloride is available in one-pint cans for use as a spot remover and fumigant for general household use. Dichlor Ethyl Ether is recommended for dry-cleaning establishments because it has the correct rate of evaporation for professional "spotting."

EXTRACTION OF OILS

Ethylene Dichloride is being used successfully for the extraction of oil and fats from seeds. A new and interesting development, which has been described in the literature, is its use in the separation of the vitamin fraction from cod liver oil.

RUBBER INDUSTRY

Ethylene Dichloride is a solvent for rubber and finds many uses in the industry such as a vehicle for rubber compositions and cements and in the cleaning of equipment.

DEGREASING METALS

Dichlor Ethyl Ether and Ethylene Dichloride are both particularly satisfactory for this purpose, not only because of their solvent powers but because they are usually stable and free from corrosive action.

For further information address our Technical Department

CARBIDE AND CARBON CHEMICALS CORPORATION

Carbide and Carbon Building

30 East Forty-second Street, New York, N. Y.

Unit of Union Carbide UCC ***and Carbon Corporation***

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

the end of April, 1928, an increase of 1,129,149 gallons, or 8 per cent.

Ammonia — The season of most active consumption of anhydrous is under way and producers report shipments in large quantities. Aqua is also moving in large quantities.

Ammonium Chloride — Prices are firmly held and a steady and firm demand has continued thus far during the summer months which condition is quite unusual for this season of the year. In fact June business has exceeded that for June of last year. Imports for the first five months of this year are much lower than for the corresponding period of last year which is significant as an evidence of the progress being made by domestic producers.

Ammonium Sulfate — The new price schedule was of chief interest and proved to be about what had been expected. Owing to lower nitrate prices for next season leading producers of ammonia sulfate have reduced their selling schedule for next year from $2 to $3 a ton. For equal deliveries over the year producers are naming $41 a ton, while for selected months $44 a ton is being quoted. The past season has in no way measured up to the success of the 1927-28 season but it is thought that now prospects for the future are much more promising.

Antimony — Although the Chinese market seems somewhat stronger, conditions here have continued quiet and dull, so that prices have declined considerably during the past month. Metal is now at 8⅞c lb., needle at 9c lb., and oxide at 9c @ 9¼c lb.

Barium Chloride — Continues in heavy demand with prices firmly maintained by domestic producers at a level which removes any inducement to import the material.

Beeswax — Imports of beeswax and other animal wax into the United States for the past two years and the first three months of 1929 were 5,041,000 pounds, valued at $1,635,000; 4,402,000 pounds, with a value of $1,510,000, and 1,214,624 pounds, having a value of $420,962, respectively. About 10 per cent of the United States total beeswax imports are supplied by Cuba. Imports from this country for the past six years have averaged approximately 400,000 pounds, and

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Barium			
57.00	47.00	47.50	47.50	Barium, Carbonate, 200 lb bags wks....ton	58.00	60.00	57.00
.12½	.12	.12	.12	Chlorate, 112 lb kegs NY..lb.	.14	.15	.14
65.00	54.00	65.00	57.50	Chloride, 800 lb bbl wks...ton	65.00	68.00	63.00
.13½	.13	.13	.13	Dioxide, 88%, 690 lb drs...lb.	.12	.13	.12
.04½	.04½	.04½	.04½	Hydrate, 500 lb bbls.....lb.	.04½	.05½	.04½
.08	.07½	.07½	.07½	Nitrate, 700 lb casks.....lb.	.08½	.08½	.08½
24.00	23.00	23.00	23.00	Barytes, Floated, 350 lb bbls wks....ton	23.00	24.00	24.00
8.00	5.00	.....	.....	Bauxite, bulk, mines.....ton	5.00	8.00	8.00
.38	.36	.40	.37	Beeswax, Yellow, crude bags..lb.	.....	.34	.37
.43	.41	.46	.38	Refined, cases.....lb.	.....	.41	.42
.58	.56	.58	.56	White, cases.....lb.	.51	.53	.53
.70	.65	.65	.65	Benzaldehyde, technical, 945 lb drums wks.....lb.	.60	.65	.65
				Benzene			
23	.21	.23	.21	Benzene, 90%, Industrial, 8000 gal tanks wks.....gal.	.....	.23	.23
.23	.21	.23	.21	Ind. Pure, tanks works....gal.	.....	.23	.23
.74	.70	.70	.70	Benzidine Base, dry, 250 lb bbls.....lb.	.70	.74	.74
1.00	1.00	1.00	1.00	Benzoyl, Chloride, 500 lb drs.lb.	.....	1.00	1.00
.25	.25	.....	.....	Benzyl, Chloride, tech drs....lb.	.....	.25	.25
.26	.24	.24	.24	Beta-Naphthol, 250 lb bbl wk.lb.	.24	.26	.26
1.35	1.35	1.35	1.35	Naphthylamine, sublimed, 200 lb bbls.....lb.	.....	1.35	1.35
.65	.63	.63	.63	Tech, 200 lb bbls.....lb.	.60	.65	.68
90.00	80.00	80.00	80.00	Blanc Fixe, 400 lb bbls wks..ton	80.00	90.00	90.00
				Bleaching Powder			
2.25	2.25	2.25	2.00	Bleaching Powder, 300 lb drs c-1 wks contract.....100 lb.	.....	2.25	2.25
2.00	2.00	2.25	2.00	700 lb drs c-1 wks contract .....100 lb.	.....	4.00	4.00
5.25	4.65	3.75	4.75	Blood, Dried, fob, NY.....Unit	.....	4.00	4.60
5.35	4.75	.....	.....	Chicago.....Unit	.....	4.40	4.85
5.05	4.50	.....	.....	S. American shipt.....Unit	.....	4.25	4.70
.35	.31	.30	.28	Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.....	.35	.35
30.00	29.00	38.00	29.00	Bone, raw, Chicago.....ton	.....	42.00	42.00
.07	.06	.06	.06	Bone, Ash, 100 lb kegs.....lb.	.06	.07	.07
.08½	.08½	.08½	.08½	Black, 200 lb bbls.....lb.	.....	.08½	.08½
37.00	31.00	30.00	28.00	Meal, 3% & 50%, Imp....ton	.....	31.00	35.00
.05	.02½	.04½	.04½	Borax, bags.....lb.	.02½	.03½	.03½
.12	.10½	.11	.11	Bordeaux, Mixture, 16% pwd..lb.	.10½	.12	.12
.10	.08	.08	.08	Paste, bbls.....lb.	.10	.10½	.10½
28.00	26.00	28.00	26.00	Brazilwood, sticks, shpmt....lb.	26.00	28.00	28.00
1.20	.60	.60	.60	Bronze, Aluminum, powd blk.lb.	.60	1.20	1.20
1.25	.55	.55	.55	Gold bulk.....lb.	.55	1.25	1.25
1.60	1.40	1.60	1.42	Butyl, Acetate, normal drs 1c-1 wks.....gal.	1.35	1.40	1.45
1.55	1.35	1.55	1.42	Tank, drs wks.....gal.	1.32	1.35	1.35
1.05	1.00	1.00	1.00	Secondary, 50 gal drs.....gal.	1.00	1.05	1.05
.70	.70	.70	.70	Aldehyde, 50 gal drs wks...lb.	.....	.70	.70
				Carbitol (see Diethylene Glycol Mono Butyl Ether).....	.....	.....	.....
				Cellosolve (see Ethylene glycol mono butyl ether).....			
				Furoate, tech., 50 gal. dr., lb.	.....	.50	.50
.36	.34	.34	.34	Propionate, drs.....lb.	.34	.36	.36
.60	.60	.60	.60	Stearate, 50 gal drs.....lb.	.....	.60	.60
.60	.57	.57	.57	Tartrate, drs.....lb.	.57	.60	.60
2.00	1.35	1.50	1.35	Cadmium, Sulfide, boxes.....lb.	.95	1.75	1.75
				Calcium			
4.50	3.50	3.50	3.50	Calcium, Acetate, 150 lb bags c-1.....100 lb.	.....	4.50	4.50
.09	.06	.07½	.07½	Arsenate, 100 lb bbls c-1 wks.....lb.	.07	.09	.09
.06	.05	.05	.05	Carbide, drs.....lb.	.05	.06	.06
1.00	1.00	1.00	1.00	Carbonate, tech, 100 lb bags c-1.....lb.	1.00	1.00	1.00
27.00	25.00	27.00	27.00	Chloride, Flake, 375 lb drs c-1 wks.....ton	.....	22.75	25.00
23.00	20.00	21.00	21.00	Solid, 650 lb drs c-1 fob wks .....ton	20.00	20.00	20.00
52.00	52.00	52.00	52.00	Nitrate, 220 lb bbls c-1 NY.ton	.....	52.00	52.00
.....	.....	.....	.....	Peroxide, 100 lb. drs.....lb.	.....	1.25	1.25
.08	.07	.09	.09	Phosphate, tech, 450 lb bbls lb.	.08	.08½	.08
				Stearate, 100 lb bbls.....lb.	.25	.26	.26
				Calurea, bags.....ton	.....	88.75	88.75
				S. points.....	.....	88.30	88.30
.18	.18	.....	.....	Camwood, Bark, ground bbls..lb.	.....	.18	.18
.28	.22	.33	.33	Candelilla Wax, bags.....lb.	.23	.24	.24
				Carbitol, (See Diethylene Glycol Mono Methyl Ether).....	.....	.....	.....
.15	.08	.08	.08	Carbon, Decolorizing, 40 lb bags c-1.....lb.	.08	.15	.15
12	.12	.12	.12	Black, 100-300 lb cases 1c-1 NY.....lb.	.....	.12	.12
.06	.05½	.05'	.05½	Bisulfide, 500 lb drs 1c-1 NY.....lb.	.05½	.06	.06
.06	.06	.06	.06	Dioxide, Liq. 20-25 lb cyl..lb.	.....	.06	.06
.07½	07	.07	.07	Tetrachloride, 1400 lb drs delivered.....lb.	.06½	.07½	.07½
.58	.45	.50	50	Carnauba Wax, Flor, bags....lb.	.39	.40	.43
.60	.40	.90	.54	No. 1 Yellow, bags.....lb.	.....	.34½	.40
.38	.34	37	.24	No. 2 N Country, bags.....lb.	.....	.28	.32
.56	.38	.68	.48	No. 2 Regular, bags.....lb.	.33	.34	.36
.32	.25	.....	.....	No. 3 N. C.....lb.	.....	.25	.25
.32	.25½	.....	.....	No. 3 Chalky.....lb.	.....	.24	.26
.18¼	.14½	.18½	.15½	Casein, Standard, ground.....lb.	.15	.15½	.16

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Organic Chemicals

from 40 to 50 per cent of this amount has been shipped through the port of Santiago de Cuba.

Benzene — The past month and its predecessor were two of the best months in the recent history of this material. Not only has the domestic demand been unusually heavy, but there is also a very good export demand.

Blood — In common with most members of the fertilizer group, prices here are off somewhat due to inactivity which characterizes this period of the year. Material is quoted at $4.00 per unit, New York, and $4.40 per unit Chicago, while South American remains unchanged.

Butyl Acetate — Moving in routine volume with a considerable improvement noticeable in the adherence of producers to quoted prices which are on the basis of $1.32 per gallon in tanks.

Calcium Acetate — Continues in heavy demand and shows no effect of the slightly easier conditions existing in acetic acid. Supply has been sufficient, however, to take care of the demand, with production for June estimated at about the same quantity as was produced in May. Although it is impossible to estimate just what the July production will be it is thought that it may possibly fall off somewhat due to the difficulties of disposing of the charcoal produced.

Calcium Chloride — Continues to break all previously existing records. June business is more than 50 per cent over that of June a year ago, which previously held the record. In addition to the fact that there is a naturally enlarging market for the use of this material in road work, there is the fairly recent development of the use of this material in producing a dustless coal which has tremendously enlarged the market for this material. Of the total 1,169,608 pounds of calcium chloride exported by this country during March last, 978,395 pounds, valued at $10,394, went to Canada. The value of the total exported for the month was $13,313.

Carnauba Wax — All grades have declined from 1c @ 1½c lb. due to a slackened demand during the past month.

Casein — Standard ground has declined ½c lb. during the past month and is now at 15c @ 15½c lb. This is of course the dull season for consumers of this material, but business proceeds in fair volume considering the season of the year.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cellosolve (see Ethylene glycol mono ethyl ether)			
				Acetate (see Ethylene glycol mono ethyl ether acetate)			
.30	.26	.34	.26	Celluloid, Scraps, Ivory cs....lb.	.26	.30	.26
.20	.18	.18	.18	Shell, cases....lb.	.18	.20	.20	.18
.32	.30	.34	.26	Transparent, cases....lb.	.30	.32	.32	.30
1.40	1.40	1.40	1.40	Cellulose, Acetate, 50 lb kegs .lb.	1.20	1.25	1.25	1.20
.03¾	.03	.03	.03	Chalk, dropped, 175 lb bbls...lb.	.03	.03¼	.03¼	.03
.04½	.04½	.02½	.02½	Precip, heavy, 560 lb cks...lb.	.02	.03½	.03½	.02
.03½	.02½	.04½	.04½	Light, 250 lb casks....lb.	.02½	.03½	.03½	.02½
.19	.18	.18	.18	Charcoal, Hardwood, lump, bulk wks....bu.	.18	.19	.19	.18
.06½	.06	.06	.06	Willow, powd, 100 lb bbl wks....lb.	.06	.06½	.06½	.06
.05	.04	.04	.04	Wood, powd, 100 lb bbls...lb.	.04	.05	.05	.04
.03	.02	.03	.02½	Chestnut, clarified bbls wks,..lb.	.02½	.03	.02	.03½
.02	.01½	.02	.01½	25% tks wks....lb.	.01½	.02	.02	.01½
.04 4/5	.04 4/5	.05½	.05½	Powd, 60%, 100 lb bgs wks.lb.	.....	.04 4/5	.04 4/5	.04 4/5
.06	.05½	.06½	.06½	Powd, decolorized bgs wks..lb.	.05½	.06	.06	.05½
9.00	8.00	8.00	8.00	China Clay, lump, blk mines.ton	8.00	9.00	9.00	8.00
.02	.01½	.01½	.01½	Powdered, bbls....lb.	.01½	.02	.02	.01½
12.00	10.00	10.00	10.00	Pulverized, bbls wks....ton	10.00	12.00	12.00	10.00
25.00	15.00	15.00	15.00	Imported, lump, bulk....ton	15.00	25.00	25.00	15.00
.03½	.03	.03	.03	Powdered, bbls....lb.	.03	.03½	.03½	.03
				Chlorine			
.09	.08	.08	.08	Chlorine, cyls 1c-1 wks contract ....lb.	.07½	.08½	.08½	.07½
.....	.....	.....	.....	cyls, cl wks,. contract ...lb.	.....	.04½	.04½	.04½
.03½	.03½	.05½	.04	Liq tank or multi-car lot cyls wks contract....lb.	.....	.03	.03	.03
.07	.07	.07	.07	Chlorobenzene, Mono, 100 lb. drs 1c-1 wks....lb.	.08½	.09½	.09½	.08½
.22	.20	.20	.20	Chloroform, tech, 1000 lb drs..lb.	.18	.20	.20	.18
1.35	1.00	1.00	1.00	Chloropicrin, comml cyls....lb.	1.00	1.35	1.35	1.00
.29	.26	.27	.26	Chrome, Green, CP....lb.	.26	.29	.29	.26
.11	.06½	.06½	.06½	Commercial....lb.	.06½	.11	.11	.06½
.17	.15½	.17½	.16½	Yellow....lb.	.17	.18	.18	.15
.05½	.04½	.05	.04½	Chromium, Acetate, 8% Chrome bbls....lb.	.04½	.05½	.05½	.04½
.05½	.05½	.05½	.05½	20° soln, 400 lb bbls....lb.	.....	.05½	.05½	.05½
.28	.27	.27	.27	Fluoride, powd, 400 lb bbl..lb.	.27	.28	.28	.27
.35½	.34½	.34½	.34½	Oxide, green, bbls....lb.	.34½	.35½	.35½	.34½
9.50	9.00	9.50	9.00	Coal tar, bbls....bbl	10.00	10.50	10.50	10.00
2.22	2.10	2.10	2.10	Cobalt Oxide, black, bags....lb.	2.10	2.22	2.22	2.10
.87	.84	.92	.77	Cochineal, gray or black bag..lb.	.....	.95	.95	.95
.86	.86	.92	.77	Teneriffe silver, bags....lb.	.....	.95	.95	.95
				Copper			
17.00	12.90	13.57½	12.90	Copper, metal, electrol...100 lb.	.....	17.78	24.00	17.00
.17½	.16	.16½	.06½	Carbonate, 400 lb bbls....lb.	.19	.25	.25	.18
.28	.28	.28	.28	Chloride, 250 lb bbls....lb.	.25	.28	.28	.25
.50	.48	.48	.48	Cyanide, 100 lb drs....lb.	.50	.55	.60	.48
.17	.16½	.16½	.16½	Oxide, red, 100 lb bbls....lb.	.24	.32	.32	.16½
.19	.18	.18	.17	Sub-acetate verdigris, 400 lb bbls....lb.	.18	.19	.19	.18
5.50	5.05	5.00	4.75	Sulfate, bbls c-1 wks...100 lb.	.....	6.00	7.00	5.65
14.00	13.00	17.00	13.00	Copperas, crys and sugar bulk c-1 wks....ton	13.00	14.00	14.00	13.00
1.35	1.25	1.25	1.25	Sugar, 100 lb bbls....100 lb.	1.25	1.35	1.35	1.25
.42	.40	.40	.40	Cotton, Soluble, wet, 100 lb bbls....lb.	.40	.42	.42	.40
.....	.....	42.00	20.00	Cottonseed, S. E. bulk c-1...ton	.....	.....	.....	.....
.....	.....	42.00	20.00	Meal S. E. bulk....ton	.....	.....	.....	.....
38.00	36.00	35.00	21.50	7% Amm., bags mills...ton	37.50	38.00	38.00	37.50
.27½	.26	.27	.22	Cream Tartar, USP, 300 lb. bbls....lb.	.....	.27	.28	.27
.42	.40	.40	.40	Creosote, USP, 42 lb cbys....lb.	.40	.42	.42	.40
.19	.17	.20	.20	Oil, Natural, 50 gal drs....gal.	.17	.19	.19	.17
.23	.21	.25	.25	10-15% tar acid....gal.	.21	.23	.23	.21
.28	.25	.....	.....	25-30% tar acid....gal.	.25	.28	.28	.25
.20	.17½	.17½	.17½	Cresol, USP, drums....lb.	.14	.17	.17	.14
.17	.16	.17	.16	Crotonaldehyde, 50 gal dr....lb.	.32	.36		
.18½	.18½	.18½	.15	Cudbear, English....lb.	.16	.17	.17	.16
.07	.06	.05	.05½	Cutch, Rangoon, 100 lb bales..lb.	.14	.16	.16	.14
				Borneo, Solid, 100 lb bale..lb.	.08	.08½	.08½	.08
1.75	1.67½	1.82½	1.67½	Cyanamide, bulk c-1 wks Amm. ....lb.	.....	1.70	1.70	1.70
5.12	3.77	3.92	3.77	Dextrin, corn, 140 lb bags.100 lb.	4.62	4.82	4.82	4.62
5.07	3.72	3.87	3.72	White, 130 lb bags....100 lb.	4.57	4.77	4.77	4.57
.09	.08	.08½	.08½	Potato, Yellow, 220 lb bgs..lb.	.08	.09	.09	.08
.09	.08	.08½	.08½	White, 220 lb bags 1c-1....lb.	.08	.09	.09	.08
.08½	.08	.08½	.08	Tapioca, 200 lb bags 1c-1...lb.	.08	.08½	.08½	.08
.....	.....	3.80	3.80	Diaminophenol, 100 lb kegs...lb.	.....	3.80	3.80	3.80
3.80	3.80	2.95	2.85	Diamylphthalate, drs wks...gal.	.....	3.80	3.80	3.80
2.90	2.85	3.25	3.25	Dianisidine, 100 lb kegs....lb.	3.00	3.10	3.10	3.00
.28	.26½	.31½	.29½	Dibutylphthalate, wks....lb.	.....	.26½	.26½	.26½
.31½	.29½	.55	.55	Dibutyltartrate, 50 gal drs....lb.	.29½	.31½	.31½	.29½
.....	.....	.....	.....	Dichloroethylether, 50 gal drs lb.	.05	.07	.13	.05
.65	.55	.23	.23	Dichloromethane, drs wks....lb.	.55	.65	.65	.55
.25	.23	2.15	2.15	Diethylamine, 400 lb drs....lb.	2.75	3.00	3.00	2.75
2.15	2.15	1 85	1.85	Diethylcarbonate, drs .....gal.	1.85	1.90	1.90	1.85
2.00	1.85	.55	.55	Diethylaniline, 850 lb drs....lb.	.55	.60	.60	.55
.60	.55.	20	.20	Diethyleneglycol, drs....lb.	.10	.12	.13	.10
.15	.10	.....	.....	Mono ethyl ether, drs....lb.	.13	.15	.15	.13
.35	.25	.....	.....	Mono butyl ether, drs....lb.	.28	.30	.30	.25
.....	.....	.....	.....	Mono methyl ether, 50 gal. dr....lb.	.15	.18	.15	.13
.....	.....	.....	.....	Diethylene oxide, 50 gal dr....lb.	.....	.22	.22	.15
.67	.64	.64	.64	Diethylorthotoluidin, drs....lb.	.64	.50	.50	.50
.26	.24	.25	.25	Diethyl phthalate, 1000 lb drums....lb.	.24	.67	.67	.64
.35	.30	.30	.30	Diethylsulfate, technical, 50 gal drums....lb.	.30	.26	.26	.24
2.62	2.62	2.60	2.60	Dimethylamine, 400 lb drs...lb.	.....	.35	.35	.30
.32	.30	.32	.30	Dimethylaniline, 340 lb drs...lb.	.30	2.62	2.62	2.62
						.32	.32	.30

THE first half of the Nineteenth Century saw the birth and early growth of the chemical industry in the United States. At this time there were established two great chemical organizations whose growth and ability to serve have kept pace with the rapid expansion of the republic.

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

Copper Sulfate — Although demand has been somewhat better during June than previously it is far from what is normal for this season of the year and considerably below the level for June of last year. As a partial explanation of the present low level of new business, it is pointed out that more material was shipped during the first five months of this year than during the similar period of any other year. New business for the past three months, however, is by no means up to that of the same period of last year or even up to the average of the past ten years. Last year may have been exceptional as it was a particularly bad year for fungus diseases, but even taking that fact into consideration business has not been up to normal. No price changes in either the metal or the sulfate are expected within the next month.

Egg Yolk — Is becoming more plentiful again with the arrival of the new crop in increasing quantities. As a result, prices are lower at 78c @ 80c lb., with further reductions quite likely before long.

Ethyl Acetate — Is moving in rather routine demand due to some slackening of demand from the automobile industry, but prices are holding firmly on the basis of 90c gal. in tanks, with the exception of one quarter where material has been available at lower prices.

Fish Scrap — Is once more available and is being quoted on the basis of $4.00 & 10 per unit at the works, with acid at $4.00 & 50 per unit.

Formaldehyde — A fair demand has prevailed both from domestic and export trades during the past month. Prices have been fairly well maintained as might be expected because of strong raw material prices.

Glycerin — Continues to be in rather poor demand with traces of weakness. Imports of crude glycerine during March totaled 3,084,572 pounds, valued at $175,465. Arrivals of refined during that period amounted to 730,355 pounds, valued at $67,087.

Gums — Sandarac is again higher at 68c @ 70c lb. as the shortage of spot stocks becomes more apparent. The clean opaque grade of Copal is also higher at 16c @ 17c lb. All grades of Singapore are 1c @ 2c lb. lower, as is E. Seeds, Batavia.

Mercury — Has continued unchanged during the past month with the movement

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.50	.45	.45	.45	Dimethylsulfate, 100 lb drs...lb.	.45	.50	.50	.45
.16½	.15½	.15½	.15	Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.16½	.15½
.19	.18	.18	.18	Dinitrochlorine, 300 lb bbl....lb.	.18	.19	.19	.18
.16	.15	.15	.15	Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.15	.15
.34	.32	.32	.32	Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.37	.34
.32	.31	.31	.31	Dinitrophenol, 350 lb bbls....lb.	.31	.32	.32	.31
.19	.18	.18	.15	Dinitrotoluene, 300 lb bbls...lb.	18	.19	.19	.18
.90	.48	1.05	.85	Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.49	.42
.....	.....	.....	.....	Dioxan (See Diethylene Oxide)	.....	.....	.....	.....
.47	.45	.18	.45	Diphenyl.....lb.	.40	.50	.50	.40
.72	.40	.....	.....	Diphenylamine.....lb.	.....	.40	.47	.40
.30	.26	.26	.26	Diphenylguanidine, 100 lb bbl lb.	.30	.35	.40	.30
62.00	58.00	49.00	41.00	Dip Oil, 25%, drums.....lb.	.26	.30	.30	.26
.05½	.05	.04	.04	Divi Divi pods, bgs shipmt..ton	.....	49.00	57.00	49.00
.82	.73	.84	.72	Extract.....lb.	.05	.05½	.05½	.05
1.75	1.7	2.00	1.75	Egg Yolk, 200 lb cases.....lb.	.78	.80	.84	.77
.38	.37	.45	.37	Epsom Salt, tech, 300 lb bbls c-1 NY.....100 lb.	1.70	1.75	1.75	1.75
1.05	.75	.90	.90	Ether, USP, 1880, 50 lb drs..lb.	.38	.39	.39	.38
1.25	1.10	1.10	1.03	Ethyl Acetate, 85% Ester, 110 gal drs.....gal.	.95	.98	1.05	.95
.....	.....	.....	.....	99% gal drums.....gal.	1.15	1.18	1.25	1.15
1.11	1.05	1.05	1.05	Acetoacetate, 50 gal drs...gal.	.65	.68	.68	.65
.70	.70	.50	.50	Benzylaniline, 300 lb drs...lb.	1.05	1.11	1.11	1.05
.....	.....	.....	.....	Bromide, tech, drums .....lb.	.50	.55	.55	.50
.22	.22	.22	.22	Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.90	1.85
.....	.....	.....	.....	Chloride, 200 lb. drums....lb.	.....	.22	.22	.22
.....	.....	.....	.....	Chlorocarbonate, 50 gal dr.gal.	.35	.40	.40	.35
				Ether, Absolute, 50 gal drs..lb.	.50	.52	.52	.50
3.50	3.50	3.50	3.50	Furoate, 1 lb tins .....lb.	.....	5.00	5.00	5.00
.30	.30	.30	.30	Lactate, drums works.....lb.	.25	.29	.35	.25
.55	.45	.45	.45	Methyl Ketone, 50 gal drs..lb.	.....	.30	.30	.30
.36	.30	.....	.....	Oxalate, drums works.....lb.	.45	.55	.55	.45
.70	.70	.70	.70	Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.36	.30
				Ethylene Bromide, 60 lb dr...lb.	.....	.70	.70	.79
.85	.75	.75	.75	Chlorhydrin, 40%, 50 gal drs chloro. cont.....lb.	.75	.85	.85	.75
.11	.07	.15	.11	Dichloride, 50 gal drums...lb.	.05	.07	.10	.05
.40	.25	.30	.30	Glycol, 50 gal drs wks.....lb.	.25	.28	.30	.25
.27	.31	.....	.....	Mono Butyl Ether drs wks.	.23	.27	.31	.23
.20	.24	.....	.....	Mono Ethyl Ether drs wks	.16	.20	.24	.16
.23	.26	.....	.....	Mono Ethyl Ether Acetate dr. wks.....	.19	.23	.26	.19
				Mono Methyl Ether, drs.lb.	.19	.23	.23	.19
				Oxide, cyl.....lb.	.....	2.00		
.65	.62	.62	.62	Ethylidenaniline.....lb.	.62	.65	.65	.62
25.00	20.00	20.00	20.00	Feldspar, bulk.....ton	40.00	25.00	25.00	20.00
21.00	15.00	15.00	15.00	Powdered, bulk works.....ton	15.00	.21	21.00	15.00
.09	.07½	.07½	.07½	Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.07½	.09	.09	.07½
5.50&10	4.90&10	5.60	4.15	Fish Scrap, dried, wks.....unit	.....	4.00&10	4.00&10	4.00&10
4.75&50	4.00&50	3.50	4.24	Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	4.00&50	4.00&50	4.00&50
1.15	1.10	1.10	.90	Flavine, lemon, 55 lb cases...lb.	1.10	1.15	1.15	1.10
1.15	1.10	1.10	.85	Orange, 70 lb cases.....lb.	1.10	1.15	1.15	1.10
				Flaxseed.....lb.	.....	.....		
.....	.....	.....	.....	Ex-dock.....ton	.....	25.00	25.00	25.00
25.00	25.00	25.00	25.00	Fluorspar, 98%, bags.....	41.00	46.00	46.00	41.00
				Formaldehyde				
.....	.....	.....	.....	Formaldehyde, aniline, 100 lb.	.....	.....	.....	.....
.42	.39	.39	.39	drums.....lb.	.39	.42	.42	.39
.09	.08½	.11½	.08½	USP, 400 lb bbls 1c-1 wks..lb.	.09½	.10	.10	.09½
.04	.02½	.02½	.02½	Fossil Flour.....lb.	.02½	.04	.04	.02½
20.00	15.00	15.00	15.00	Fullers Earth, bulk, mines ..ton	15.00	20.00	20.00	15.00
30.00	25.00	25.00	25.00	Imp. powd c-1 bags.....ton	25.00	30.00	30.00	25.00
.19½	.1 ⅛	.17½	.17½	Furfural 500 lb drums .....lb.	.17½	.19½	.19½	.17½
.....	.....	.....	.....	Furfuramide (tech) 100 lb dr..lb.	.....	.30	.30	.30
.....	.....	.....	.....	Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	5.00	5.00
.....	.....	.....	.....	Alcohol, (tech) 100 lb dr....lb.	.....	.50	.50	.50
				Furoic Acid (tech) 100 lb dr...lb.	.....	.50	1.00	.50
1.35	1.35	1.69	1.35	Fusel Oil, 10% impurities ...gal.	.....	1.35	1.35	1.35
.05	.04	.04	.04	Fustic, chips.....lb.	.04	.05	.05	.04
.22	.20	.20	.20	Crystals, 100 lb boxes.....lb.	.20	.22	.22	.20
.10	.09	.09	.09	Liquid, 50°, 600 lb bbls....lb.	.09	10	.10	.09
.23	.20	.20	.20	Solid, 50 lb boxes.....lb.	.14	.16	.16	.14
32.00	30.00	30.00	30.00	Sticks.....ton	25.00	26.00	26.00	25.00
.52	.50	.50	.50	G Salt paste, 360 lb bbls.....lb.	.45	.50	.52	.45
21	.20	.20	.20	Gall Extract.....lb.	.20	.21	.21	.20
.09	.08	.08	.06	Gambier, common 200 lb cs...lb.	.06	.07	.07	.06
.14	.12	.12	.12	25% liquid, 450 lb bbls....lb.	.12	.14	.14	.12
.12	.11	.23	.11	Singapore cubes, 150 lb bg..lb.	.08½	.09	.09	.08½
.50	.45	.45	.30	Gelatin, tech, 100 lb cases...lb.	.45	.50	.50	.45
3.24	3.14	3.14	3.14	Bags, c-1 NY.....100 lb.	3.14	3.24	3.24	3.14
1.00	.70	1.05	1.05	Glauber s Salt, tech, c-1 wks.....100 lb.	1.00	1.70	1.70	.70
3.34	3.24	3.24	3.24	Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	3.24	3.34	3.34	3.20
3.14	3.14	3.14	3.14	Tanner's Special, 100 lb bags .....100 lb.	.....	3.14	3.14	3.14
.24	.20	.20	.20	Glue, medium white, bbls ...lb.	.20	.24	.24	.20
.26	.22	.22	.22	Pure white, bbls.....lb.	.22	.26	.26	.22
.19	.15	.29	.22	Glycerin, CP, 550 lb drs.....lb.	.15½	.16	.16	.15½
.15	.11½	.25	.17	Dynamite, 100 lb drs.....lb.	.12	.12½	.12½	.12
.10½	.08½	.....	.....	Saponification, tanks.....lb.	.08½	.08½	.08½	.08½
.09½	.07½	.....	.....	Soap Lye, tanks.....lb.	.....	.07½	.07½	.07½
35.00	15.00	15.00	15.00	Graphite, crude, 220 lb bgs...ton	15.00	35.00	35.00	15.00
.09	.06	.05	.05	Flake, 500 lb bbls.....lb.	.06	.09	.09	.06
				Gums				
.04½	.03½	.03½	.03½	Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03½	.04½	.04½	.03½
.06½	.06½	.06½	.06	Powd, 150 lb bags .....lb.	.06	.06½	.06½	.06

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

about normal for this time of the year. Quotations are now at $122.00 per flask and but little change in conditions generally is expected much before October. Production of mercury in the United States in 1928 amounted to 16,838 flasks (75 pounds each), according to the Bureau of Mines of the Department of Commerce. The calculated value of the production, using the average price of mercury during the year, is $2,052,215. This is the largest domestic production since 1919, when 21,415 flasks, valued at $1,933,560, was produced, but it is only approximately half as large as the average annual production for the period 1850-1921. The production in 1927 was 11,276 flasks, valued at $1,314,782. The average quoted price at New York for 1928, $123,506 a flask of 76 pounds, is the highest ever recorded, with the exception of the average prices in 1916 and 1918. In 1928, 15,583 flasks of mercury, valued at $1,572,017 were imported, compared with 24,650 flasks, valued at $2,189,495, in 1927. Of the 15,583 flasks imported in 1928, 6,189 flasks were derived from Spain, 5,718 flasks from Italy, 1,816 flasks from Mexico, 913 flasks from Belgium, 546 flasks from Germany, and 401 flasks from the United Kingdom. In 1927, 13,663 flasks came from Spain, 9,089 flasks from Italy and 1,898 flasks from other countries. Production in the United States plus imports indicated 32,421 flasks made available in 1928 compared with 35,926 flasks made available in 1927.

Methanol — Is in little easier supply with the demand unchanged and quite heavy. The market is especially strengthened by the continued heavy demand for the denaturing grade. April production of crude methanol based on reports by the entire industry to the Department of Commerce, was 731,811 gallons, as compared with 714,266 gallons in March and 657,253 gallons in April, 1928.

Methyl Acetone — Continued in good domestic demand and is further strengthened by a considerable export business.

Nitre Cake — The rather tight position continues on this commodity and as a result increased imported material is noticeable. Prices are firmly maintained at quoted levels.

Phenol — Supplies of this material continue to demand a premium on spot and producers are working to capacity to meet their shipments. There are as yet no indications of any easing of the situation.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.20	.18	.18	.18	Yellow, 150-200 lb bags....lb.	18	.20	.20	.18
				Animi (Zanzibar) bean & pea				
.40	.35	.40	.35	250 lb cases.....lb.	.35	.40	.40	.35
.55	.50	.60	.50	Glassy, 250 lb cases.....lb.	.50	.55	.55	.50
				Asphaltum, Barbadoes (Manjak)				
.12	.09	.09	.09	200 lb bags.....lb.	.09	.12	.12	.09
.17	.15	.15	.15	Egyptian, 200 lb cases.....lb.	.15	.17	.17	.15
65.00	55.00	55.00	55.00	Gilsonite Selects, 200 lb bags .....ton	58.00	65.00	65.00	58.00
				Damar Batavia standard 136, lb				
.26	.22½	.26½	.26½	cases.....lb.	.23	.24	.26	.23
.11	.10½	.10½	.07	Batavia Dust, 160 lb bags....lb.	.10½	.11	.11	.10½
.17½	.16	.18½	.17½	E Seeds, 136 lb cases.....lb.	.16	.16½	.17½	.16
				F Splinters, 136 lb cases and				
.14½	.13	.14	.09	bags.....lb.	.13	.13½	.13½	.13
.30½	.29½	.34	.33½	Singapore, No 1, 224 lb cases lb.	.28	.28½	.30½	.28
.24	.20	.22½	.21	No. 2, 224 lb cases.....lb.	.22	.22½	.24	.22
.15	.13½	.14	.11	No. 3, 180 lb bags.....lb.	.11½	.12	.14	.11½
				Benzoin Sumatra, U. S. P. 120 lb				
.48	.33	.35	.30	cases.....lb.	.38	.40	.40	.38
				Copal Congo, 112 lb bags, clean				
.15	.14	.14	.12	opaque.....lb.	.16	.17	.17	.14
.09	.08½	.08½	.08½	Dark, amber.....lb.	.08½	.09	.09	.08½
.14	.12½	.12½	.12½	Light, amber.....lb.	.12½	.14	.14	.12½
.36	.35	.35	.35	Water white.....lb.	.35	.36	.36	.35
.65	.58	.....	.....	Mastic.....lb.	.60	.62	.62	.60
				Manila, 180-190 lb baskets				
.17½	.16	.16	.16	Loba A.....lb.	.17	.17½	.17½	.17
.16½	.15	.15	.15	Loba B.....lb.	.16	.16½	.16½	.16
.14	.13	.14½	.13	Loba C.....lb.	.14	.14½	.14½	.14
.19	.16	.16	.16	Pale bold, 224 lb cs.....lb.	.17	.19	.19	.17
.13½	.12	.14	.12	Pale nubs.....lb.	.13	.13½	.13½	.13
.11	.07½	.07½	.07½	East Indies chips, 180 lb bags lb.	.10	.11	.11	.10
.21	.17	.....	.....	Pale bold, 180 lb bags....lb.	.20	.21	.21	.20
.16	.14	.17	.17	Pale nubs.....lb.	.15	.16	.16	.15
.....	.....	.....	.....	Pontianak, 224 lb cases....lb.	.....	.....		
.25½	.22	.29	.25	Pale bold gen No 1.....lb.	.22	.23	.23	.22
.15	.13	.19	.13	Pale gen chips spot.....lb.	.14½	.15	.15	.14½
.14	.13	.14	.13	Elemi, No. 1, 80-85 lb cs...lb.	.13½	.14	.14	.13½
.13½	.13	.13	.12	No. 2, 80-85 lb cases.....lb.	.13	.13½	.13½	.13
.13	.12	.13	.11	No. 3, 80-85 lb cases.....lb.	.12	.13	.13	.12
				Kauri, 224-226 lb cases No. 1				
.57	.50	.67½	.57	.....lb.	.50	.57	.57	.50
.38	.35	.44½	.38	No. 2 fair pale.....lb.	.35	.38	.38	.35
				Brown Chips, 224-226 lb				
.12	.10	.14½	.10	cases.....lb.	.10	.12	.12	.10
.....	.....	.42	.38	Bush Chips, 224-226 lb	.....	.....		
.40	.38	.....	.....	cases.....lb.	.38	.40	.40	.38
.....	.....	.....	.....	Pale Chips, 224-226 lb cases				
.26	.24½	.31½	.24½	.....lb.	.24½	.26	.26	.24½
				Sandarac, prime quality, 200				
.60	.26	.27	.25	lb bags & 300 lb casks...lb	.68	.70	.70	.60
.....	.....	.....	.....	Helium, 1 lit. bot. .....lit	.....	25.00	.20	.17
.20	.17	.12	.12	Hematine crystals, 400 lb bbls lb.	.17	.20	.11	.17
.11	.11	.09	.09	Paste, 500 bbls.....lb.	.....	.11	.11	.11
.03½	.03½	.03½	.03½	Hemlock 25%, 600 lb bbls wks lb.	.03½	.03½	.03½	.03½
16.00	16.00	16.00	16.00	Bark.....ton	.....	16.00	17.00	16.00
.60	.60	.60	.45	Hexalene, 50 gal drs wks.....lb.	.....	.60	.60	.60
.56	.62	.80	.62	Hexamethylenetetramine, drs lb.	.48	.50	.58	.48
4.00	4.00	3.35	2.75	Hoof Meal, fob Chicago....unit	.....	3.75	4.00	3.75
.....	.....	3.90	3.0	South Amer. to arrive....unit	.....	3.75	3.90	3.75
				Hydrogen Peroxide, 100 vol, 140				
.26	.24	.30	.22	lb cbys.....lb.	.24	.26	.26	.24
.15	.12	.12	.12	Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.15	.12
1.30	1.28	1.28	1.20	Indigo Madras, bbls.....lb.	1.28	1.30	1.30	1.28
.18	.15	.15	.18	20% paste, drums.....lb.	.15	.18	.18	.15
.08	.07½	.07½	.07½	Solid, powder.....lb.	.07½	.08	.08	.07½
				Iron Chloride, see Ferric or				
				Ferrous				
.10	.09	.09	.09	Iron Nitrate, kegs.....lb.	.09	.10	.10	.09
3.25	2.50	2.50	2.50	Coml, bbls.....100 lb.	2.50	3.25	3.25	2.50
.12	.10	.10	.10	Oxide, English.....lb.	.10	.12	.12	.10
.03½	.02½	.02½	.02½	Red, Spanish.....lb.	.02½	.03½	.03½	.02½
.90	.85	.85	.85	Isopropyl Acetate, 50 gal drs gal.	.85	.90	.90	.85
.20	.17	.29	.17	Japan Wax, 224 lb cases.....lb.	.....	.17	.18	.17
70.00	60.00	60.00	60.00	Kieselguhr, 95 lb bgs NY....ton	60.00	70.00	70.00	60.00
.....	.....	14.00	13.00	Lead Acetate, bbls wks...100 lb.	13.00	13.50	13.50	13.00
				White crystals, 500 lb bbls				
13.50	13.00	14.00	13.00	wks.....100 lb.	14.00	14.50	14.50	14.00
.15	.13	.15½	.13½	Arsenate, drs lc-1 wks.....lb.	.13	.15	.15	.13
				Dithiofuroate, 100 lb dr....lb.	.....	1.00		
6.25	6.25	7.80	6.20	Metal, c-1 NY.....100 lb.	.....	7.75	7.75	6.10
.14	.14	.14	.14	Nitrate, 500 lb bbls wks....lb.	.....	.14	.14	.14
.18	.17½	.17½	.17½	Oleate, bbls.....lb.	.17½	.18	.18	.17½
.08½	.08½	.10½	.08½	Oxide Litharge, 500 lb bbls.lb.	.....	.08½	.08½	.08½
.09½	.09½	.11½	.09½	Red, 500 lb bbls wks....lb.	.....	.09½	.09½	.09½
.09	.09	.09½	.09	White, 500 lb bbls wks...lb.	.....	.09½	.09½	.09
.08½	.08½	.09	.08½	Sulfate, 500 lb bbls wk...lb.	.....	.08½	.08½	.08½
				Leuna saltpetre, bags.....ton	.....	62.20	62.20	62.20
				S. points .....ton	.....	62.95	62.95	62.95
4.50	4.50	4.50	4.50	Lime, ground stone bags.....ton	.....	4.50	4.50	4.50
1.05	1.05	1.05	1.05	Live, 325 lb bbls wks...100 lb.	.....	1.05	1.05	1.05
				Lime Salts, see Calcium Salts				
.17	.15	.15	.15	Lime-Sulfur soln bbls.....gal.	.15	.17	.17	.15
				Lithopone, 400 lb bbls lc-1 wks				
.06½	.06½	.06½	.06½	.....lb.	.....	.05½	.06½	.05½
.08½	.08½	.08½	.08½	Logwood, 51°, 600 lb bbls.....lb.	.08½	.08½	.08½	.08½
.03½	.03	.03	.03	Chips, 150 lb bags.....lb.	.03	.03½	.03½	.03
.12½	.12½	.12	.12	Solid, 50 lb boxes.....lb.	.....	.12½	.12½	.12½
27.00	26.00	26.00	26.00	Sticks.....ton	24.00	26.00	26.00	24.00
.08	.07½	.07½	.07½	Lower grades.....lb.	.07½	.08	.08	.07½
.30	.30	.30	.30	Madder, Dutch.....lb.	.22	.25	.25	.22
50.00	48.00	48.00	48.00	Magnesite, calc, 500 lb bbl...ton	50.00	60.00	60.00	50.00
				Magnesium				
				Magnesium Carb, tech, 70 lb				
.06½	.06	.06½	.06	bags NY.....lb.	06	.06½	.06½	.06

Oxalic Acid
Chlorate Soda
Phosphorous Compounds

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PHILADELPHIA, PA. CAMDEN, N. J. BOSTON, MASS.

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

Rosins — The market generally has been characterized by lack of consistent buying during the past month and as a result prices are again lower on the average.

Salt Cake — Continues in rather good demand with supplies in somewhat easier position. For the four months of the current year imports of anhydrous sodium sulfate amounted to only 278 tons, a figure less than one-third that of the corresponding figure. In contrast with this, the Glaubers salt imports for the first four months of 1929 equal the total for 1928 and the salt cake import trade (32,270 tons) exceeds the 1928 total (28,228 tons). About 40 per cent. of the sale cake this year came from Germany and 55 per cent. from the Netherlands.

Shellac — The past month may be characterized as steady and quiet. Prices have remained practically the same but their has been a noticeable lack of inquiry. A report from India states that during 1928, crops of lac were good and the shellac trade experienced a large turnover owing to a strong demand for supplies from manufacturers of phonograph records. Total exports of shellac in 1928 amounted to 687,484 hundredweight (112 pounds) valued at $29,052,896. The economic condition of the shellac manufacturer is stated to be poor and although there are about 500 producers of the product, hardly 20 firms have sufficient capital for conducting their business and dependence for financial support is required from the brokers in Calcutta. The demand by the gramophone industry has to some extent offset the loss in consumption of shellac by the varnish trade. In Germany, celluloid, and in America, lacquer, have partially replaced the commodity, but the Indian industry is of the opinion that neither of these two substitutes gives the same results as shellac.

Soda Ash — Continues on its record-breaking way, with producers unable properly to forecast demand despite their most optimistic estimates regarding coming business. Each month has continued to surpass the last in actual sales and the year thus far has surpassed everything with the exception of the war years. Producers are also optimistic concerning the next six months seeing nothing which might interfere with the tremendous demands from industry generally. Prices continue extraordinarily firm and the market as a whole is in very stable condition.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Chloride flake, 375 lb. drs c-l wks.....ton	.....	36.00	36.00	36.00
37.00	27.00	37.00	37.00	Important shipment....ton	.....	33.00	33.00	33.00
33.00	33.00	33.00	33.00	Fused, imp, 900 lb bbls NY ton	.....	31.00	31.00	31.00
31.00	31.00	31.00	31.00	Fluosilicate, crys, 400 lb bbls wks.....lb.	.10	.10½	.10½	.10
.10½	.10	.10	.10	Oxide, USP, light, 100 lb bbls				
.42	.42	.42	.42	.....lb.	.....	.42	.42	.42
.50	.50	.50	.50	Heavy, 250 lb bbls.....lb.	.....	.50	.50	.50
.....	.....	.....	.....	Peroxide, 100 lb cs.....lb.	.....	1.25	1.25	1.25
.10½	.09½	.12½	.09½	Silicofluoride, bbls.....lb.	.09½	.10½	.10½	.09½
.25	.23	.23	.23	Stearate, bbls.....lb.	.25	.26	.26	.25
.24	.24	.24	.24	Manganese Borate, 30%, 200 lb bbls.....lb.	.....	.19	.24	.19
.08½	.08	.08	.08	Chloride, 600 lb casks.....lb.	.08	.08½	.08½	.08
.....	.....	.05	.04½	Dioxide, tech (peroxide) drs lb.	.04½	.06	.06	.04½
.50	.35	.....	.....	Ore, powdered or granular				
.03½	.03	.03	.03	75-80%, bbls.....lb.	.03	.03½	.03½	.03
.04½	.04	.04	.04	80-85%, bbls.....lb.	.04	.04½	.04½	.04
.05½	.05	.05	.05	85-88%, bbls.....lb.	.05	.05½	.05½	.05
.07½	.07	.07	.07	Sulfate, 550 lb drs NY.....lb.	.08	.08½	.08½	.08
Nom.	.03½	.03½	.03½	Mangrove 55%, 400 lb bbls...lb.	.03½	Nom.	Nom.	.03½
45.00	39.000	034.00	0 1 3.	Bark, African.....ton	.....	30.00	35.00	30.00
12.00	10.00	10.00	5 .	Marble Flour, bulk.....ton	14.00	15.00	15.00	14.00
				Mercurous chloride .....lb.	.....	2.05	2.05	2.05
132.00	121.00	129 99.00	.00	Mercury metal.....75lb flask	.....	122.00	124.50	120.00
.74	.72	.72	.72	Meta-nitro-aniline.....lb.	.70	.72	.74	.70
1.80	1.50	1.70	1.70	Meta-nitro-para-toluidine 200 lb. bbls.....lb.	1.50	1.55	1.55	1.50
.94	90	.90	.90	Meta-phenylene-diamine 300 lb. bbls.....lb.	.84	.90	.90	.84
.74	.72	.72	.72	Meta-toluene-diamine, 300 lb bbls.....lb.	.70	.72	.72	.70

Methanol

.58	.46	.80	.55	Methanol, (Wood Alcohol), drs 95%.....gal.	.58	.65	.65	.58
.60	.47	.87	.57	97%, drums c-1.....gal.	.60	.65	.65	.60
.63	.44	.....	.....	Pure, drums 1c-1.....gal.	.65	.68	.68	.65
.58	.48	.....	.....	Synthetic, drums c-1.....gal.	.63	.66	.66	.63
.75	45	.80	.75	Denat. gre. tanks.....gal.	.60	.62	.62	.60
.95	95	.95	.95	Methyl Acetate, drums.....gal.	.. ..	.95	.95	.95
.90	.68	.88	.75	Acetone, 100 gal drums...gal.	.83	.85	.85	.83
.95	.85	1.00	.85	Anthraquinone, kegs.....lb.	.85	.95	.95	.85
.....	.....	.....	.....	Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.60	.55
60	.55	.55	55	Chloride, 90 lb cyl.....lb.	.55	.60	.....	.....
				Furoate, tech., 50 gal. dr., lb.	.....	.50	.50	.50
80.00	65.00	.03½	.03½	Mica, dry grd. bags wks.....lb.	65.00	80.00	80.00	65.00
115.00	110.00	.05½	.05½	Wet, ground, bags wks.....lb.	110.00	115.00	115.00	110.00
.....	.....	3.00	3.00	Michler's Ketone, kegs.....lb.	.....	3.00	3.00	3.00
.75	.70	.70	.70	Monochlorobenzene, drums see, Chorobenzene, mono.....lb.	.70	.75	.75	.70
1.05	1.05	1.05	1.05	Monoethylorthotoluidin, drs. lb. Monomethylaniline, 900 lb dr .....lb.	.....	1.05	1.05	1.05
4.20	3.95	3.95	3.95	Monomethylparaminosufate 100 lb drums.....lb.	3.95	4.20	4.20	3.95
.07	.06½	.06½	.06½	Montan Wax, crude, bags....lb.	.06½	.07	.07	.06½
.04½	.04½	.04	.04	Myrobalans 25%, liq bbls....b	.04½	.04½	.04½	.04½
.08½	.08	.08	.08	50% Solid, 50 lb boxes.....lb.	.08	.08½	.08½	.08
50.00	42.00	43.50	41.00	J1 bags.....ton	.....	42.00	43.00	40.00
40.00	32.50	37.00	23.50	J 2 bags.....ton	.....	29.00	40.00	29.00
40.00	32.50	37.00	30.00	R 2 bags.....ton	.....	29.00	34.00	29.00
.18	.18	.21	.18	Naphtha, v. m. & p. (deodorized) bbls.....gal.	.....	.16	.18	.16
.06	.05½	.06	.05½	Naphthalene balls, 250 lb bbls wks.....lb.	.....	.05½	.05½	.05½
.04½	.04½	.04½	.04½	Crushed, chipped bgs wks..lb.	.....	.04½	.04½	.04½
.05	.05	.05	.04½	Flakes, 175 lb bbls wks....lb.	.....	.05	.05	.05
.24	.21	.21	.21	Nickel Chloride, bbls kegs....lb.	.21	.24	.24	.21
.38	.35	.35	.35	Oxide, 100 lb kegs NY.....lb.	.37	.40	.40	.37
.09½	.09	.09	.08½	Salt bbl. 400 bbls lb NY....lb.	.....	.13	.13	.13
.09	.08½	.08½	.08	Single, 400 lb bbls NY.....lb.	.....	.13	.13	.13
1.30	1.25	1.25	1.10	Nicotine, free 40%, 8 lb tins, cases.....lb.	1.25	1.30	1.30	1.25
1.20	.98½	1.10	1.10	Sulfate, 10 lb tins.....lb.	.98½	1.20	1.20	.98½
14.00	13.00	13.00	13.00	Nitre Cake, bulk .....ton	16.00	18.00	18.00	12.00
.10½	.10½	10½	.09½	Nitrobenzene, redistilled, 1000 lb drs wks.....lb.	.10½	.10½	.10½	.10½
Nom.	.40	.40	.40	Nitrocellulose, regular drums wks.....lb.	.40	Nom.	Nom.	.40
				Low viscosity (soln only)				
Nom.	.55	.55	.55	Grade 1 drums, wks.....lb.	.55	Nom.	Nom.	.55
Nom.	.50	.50	.50	Grade 2 drums, wks.....lb.	.50	Nom.	Nom.	.50
4.00	3.35	3.60	3.35	Nitrogenous Material, bulk..unit	.....	3.75	4.00	3.75
.25	.25	.25	.25	Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.25	.25
.15	.14	.14	.14	Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.15	.14
Nom.	.25	.25	.25	Nutgalls Aleppy, bags.....lb.	.16	.16½	.16½	.16
.18	.17	.17	.17	Chinese, bags.....lb.	.12	.13	.13	.12
.24	.22	.22	.22	Powdered, bags.....lb.	.22	.24	.24	.22
.03½	.03½	.03½	.03½	Oak, tanks, wks.....lb.	.....	.03½	.03½	.03½
.04½	.04	.04	.04	23-25% liq., 600 lb bbl wk lb.	.04	.04½	.04½	.04
50.00	45.00	45.00	45.00	Oak Bark, ground.....ton	30.00	35.00	50.00	30.00
23.00	20.00	20.00	20.00	Whole.....ton	20.00	23.00	23.00	20.00
.13½	.13	.14½	.13	Orange-Mineral, 1100 lb casks NY.....lb.	.12½	.13½	.13½	12½
2.25	2.20	2.20	2.20	Orthoaminophenol, 50 lb kgs..lb.	2.20	2.25	2.25	2.20
2.50	2.35	2.50	2.35	Orthoanisidine, 100 lb drs....lb.	2.50	2.60	2.60	2.50
.65	.50	.50	.50	Orthochlorophenol, drums....lb.	.50	.65	.65	.50
.28	.18	.18	.18	Orthocresol, drums.....lb.	.18	.28	.28	.18
.07	.06	.06	.06	Orthodichlorobenzene, 1000 lb drums.....lb.	.07	.10	.10	.07
.35	.32	.32	.32	Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	30	.33	.33	.30

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SALES OFFICE AND PLANT

Niagara Falls
NEW YORK

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

Soda Caustic — Conditions here are just as good as in the market for ash. All records are being broken here too. Particularly notable has been the tremendous increase in demand from oil refiners. Producers continue to increase their output without any sign of being able to accumulate stocks. It is with some difficulty that export demands are being met on both this material and soda ash.

Sodium Nitrate — Importers of chilean nitrate have announced the new price schedule for next season. The new schedule is from $1 to $1.50 per ton lower than those prevailing over the past year. From July 15 to September importers are naming $2.10 for carlots and $2.07½ in 100-ton lots; September is quoted at $2.10½ carlots, and $2.08 in 100-ton lots; October, $2.10 per 100-pounds, in 100-ton lots, and $2.12½ in carlots; November, $2.11 to $2.13½; December, $2.12 to $2.14½; January, 1930, $2.13 to $2.15½, and February to June, $2.15 to $2.17½ per 100 pounds. Production during May amounted to 272,274 tons as compared with 258,288 tons during May, 1928. Shipments during May were as follows: United States, 94,700 tons; 44,000 tons to Europe, 2,500 tons to Japan; 500 tons to Hawaii; and 7,800 tons to various other countries.

Sodium Phosphate — The tri grade especially leads the continued good movement of these salts into consuming channels, with producers adhering closely to quoted prices.

Sodium Sulfide — There is some talk of replacing this material with methyl amine in the tanning industry, but any such process is as yet in the experimental stage.

Starch — The majority of the German manufacturers of potato starch and starch products have arrived at a further close understanding and have formed an Interessengemeinschaft Deutscher Kartoffelstarkeindustrien G.m.b.H. The purpose of the development is to regulate prices and conditions of delivery. It is also proposed to undertake concerted propaganda work to stimulate the use of potato starch products in the inland market. The control of the new organization is vested to the extent of one-half with the Deutsche Starkeverkauf Genossenschaft G.m.b.H. and to one-half with the Vereinigung der Gewerblichen Kartoffelstarkeindustrien. The general supervision of the whole industry however, in regard to its board industrial policy remains vested in the

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Orthonitrotoluene, 1000 lb drs wk....lb.	.17	.18	.17
.18	.17	.13	.13	Orthonitrophenol, 350 lb dr...lb.	.85	.90	.85
.90	.85	.85	.85	Orthotoluidine, 350 lb bbl 1c-1 lb.	.25	30	.25
.31	.29	.29	.25	Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70
.75	.70	.70	.70	Osage Orange, crystals....lb.	.16	.17	.16
.17	.16	.16	.16	51 deg. liquid....lb.	.07	.07½	.07
.07	.07	.07	.07	Powdered, 100 lb bags....lb.	.14½	.15	.14½
.15	.14½	.14½	.14½	Paraffin, refd, 200 lb cs slabs			
.06½	.06½	.06½	.06½	123-127 deg. M. P....lb.	.06	.06½	.06½
.07½	.07½	.07½	.07½	128-132 deg. M. P....lb.	.06½	.06½	.07
.08½	.08	.08	.08	133-137 deg. M. P....lb	.07½	.07½	.07½
.10	.08½	.08½	.08½	138-140 deg. M. P....lb.	.08	.09	.09
.28	.20½	.29	.26	Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.28
1.05	1.00	1.00	1.00	Aminoacetanilid, 100 lb bg..lb.	1.00	1.05	1.05
1.30	1.25	1.25	1.25	Aminohydrochloride, 100 lb kegs....lb.	1.25	1.30	1.30
1.15	1.15	1.15	1.15	Aminophenol, 100 lb kegs..lb.	.99	1.02	1.15
.65	.50	.50	.50	Chlorophenol, drums....lb.	.50	.65	.65
.....	.....	.12	.12	Coumarone, 330 lb drums..lb.	.....	.....	.....
2.50	2.25	2.25	2.25	Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.50
.20	.17	.17	.17	Dichlorobenzene, 150 lb bbls wks....lb.	.17	.20	.20
.55	.50	.53	.50	Nitroacetanilid, 300 lb bbls.lb.	.50	.55	.55
.59	.48	.52	.52	Nitroaniline, 300 lb bbls wks ....lb.	.48	.59	.49
.32	.32	.32	.32	Nitrochlorobenzene, 1200 lb drs wks....lb.	.23	.26	.26
2.85	2.75	2.75	2.75	Nitro-orthotoluidine, 300 lb bbls....lb.	2.75	2.85	2.85
.55	.50	.50	.50	Nitrophenol 185 lb bbls....lb.	50	55	.55
.94	.92	.92	.92	Nitrosodimethylaniline, 120 lb. bbls....lb.	.92	.94	.94
.30	.30	.30	.25	Nitrotoluene, 350 lb bbls....lb.	.....	.30	.30
1.20	1.15	1.20	1.15	Phenylenediamine, 350 lb bbls ....lb.	1.15	1.20	1.20
.41	.40	.40	.40	Toluenеulfonamide, 175 lb bbls....lb.	.70	.75	.75
.22	.20	.20	.18	Toluenesulfonchloride, 410 lb bbls wks....lb.	.20	.22	.22
.42	.40	.45	.38	Toluidine, 350 lb bbls wk...lb.	.40	.42	.42
.25	20	.21	.21	Paris Green, Arsenic Basis 100 lb kegs....lb.	.....	.27	.27
.23	.17	.19	.19	250 lb kegs....lb.	.....	.25	.25
.....	.....	.25	.25	Persian Berry Ext., bbls.....lb.	.25	Nom.	.25
.03	.02½	.02½	.02½	Petrolatum, Green, 300 lb bbl.lb.	.02	.02½	.02½
.13	.20	.18	.16	Phenol, 250-100 lb drums....lb.	13½	.16	.16
1.35	1.3.	1.35	1.28	Phenyl - Alpha Naphthylamine, 100 lb kegs....lb.	.....	1.35	1.35

Phosphate

				Phosphate Acid (see Superphosphate)			
				Phosphate Rock, f.o.b. mines			
3.15	3.00	3.00	3.00	Florida Pebble, 68% basis..ton	3.00	3.15	3.15
3.65	3.50	3.50	3.50	70% basis....ton	3.75	4.00	4.00
4.15	4.00	4.00	3.85	72% basis....ton	4.25	4.50	4.50
5.00	5.00	5.35	5.00	75-74% basis....ton	5.25	5.50	5.50
5.75	5.75	5.75	5.60	75% basis....ton	.....	5.75	5.75
6.25	6.25	6.25	6.00	77-76% basis....ton	.....	6.25	6.25
5.00	5.00	5.50	5.00	Tennessee, 72% basis....ton	.....	5.00	5.00
.40	.35	.35	.35	Phosphorous Oxychloride 175 lb cyl....lb.	.35	.40	.40
.65	.60	.65	.60	Red, 110 lb cases....lb.	.55	.60	.60
.32	.32	.32	.32	Yellow, 110 lb cases wks..lb.	.....	.32	.32
.46	.46	.46	.46	Sesquisulfide, 100 lb cs....lb.	.....	.44	.46
.....	.....	.35	.35	Trichloride, cylinders....lb.	.....	.35	.35
.20	.18	.18	.18	Phthalic Anhydride, 100 lb bbls wks....lb.	.18	.20	.20
45.00	37.00	40 00	37.00	Pigments Metallic, Red or brown bags, bbls, Pa. wks....ton	37 00	45.00	45.00
.64	.63	.63	.63	Pine Oil, 55 gal drums or bbls Destructive dist....lb.	.63	.64	.64
10.60	8.00	8.00	8.00	Prime bbls....bbl.	8.00	10.60	10.60
.70	.70	.70	.66	Steam dist. bbls....gal.	.65	.70	.70
45.00	40.00	40.00	40.00	Pitch Hardwood, wks....ton	40.00	45.00	45.00
3.30	3.30	3.30	3.30	Plaster Paris, tech, 250 lb bbls ....bbl.	3.30	3.50	3.50

Potash

.07½	.07½	.07½	.07½	Potash, Caustic, wks....lb.	.....	.07½	.07½
.07½	.07½	.07½	.07½	Imported casks c-1....lb.	.....	.07½	.07½
				Potash Salts, Rough Kainit			
9.00	9.00	9.00	9.00	12.4% basis bulk....ton	.....	9.10	9.10
9.50	9.50	9.50	9.50	14% basis....ton	.....	9.60	9.60
				Manure Salts			
12.40	12.40	12.40	12.40	20% basis bulk....ton	.....	12.50	12.50
18.75	18.75	18.75	18.75	30% basis bulk....ton	.....	18.95	18.95
36.40	36.40	36.40	36.40	Potassium Muriate, 80% basis bags....ton	.....	36.75	36.75
27.00	27.00	27.00	27.00	Pot. & Mag. Sulfate, 48% basis bags....ton	.....	27.50	27.50
47.30	47.30	47.30	47.30	Potassium Sulfate, 90% basis bags....ton	.....	47.75	47.75
.09½	.09	.09	.09	Potassium Bicarbonate, USP, 320 lb bbls....lb.	.1?	.14	.14
.09½	.08½	.08½	.08	Bichromate Crystals, 725 lb casks....lb.	.09	.09½	.09½
.12½	.12	.12	.11	Powd., 725 lb cks wks....lb.	.13	.13½	.13½

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

Wirtschaftlichen Beirat der Deutschen Kartoffelstarkenidustrie e V.

Superphosphate — Production of bulk superphosphate during April as reported to the Department of Commerce by 80 concerns operating 172 plants was 357,550 tons, as compared with 320,391 tons during March.

Tankage — Has declined in price at New York points and is now quoted at $4.00 and 10 per unit. South American is also lower at $4.35 and 10 per unit, while Chicago has remained unchanged.

Toluene — Both this material and xylene continue in very heavy demand which seems to increase steadily. Producers are working to capacity to meet requirements.

Turpentine — The past month has witnessed a further decline in this market due to lack of sustained buying interest, coupled with plentiful stocks. Spirits is now at 51¼c @ 57c gal., while wood distilled is at 49c gal. Commenting upon the turpentine situation generally, "The Chemist and Druggist" of London says the following: Since the beginning of the year there has been a constant depletion of the reserve stocks of American turpentine held on this side, but curiously enough this depletion has so far had little effect on prices, which opened the year at about 49s. 6d. per cwt. for most deliveries running into midsummer. It must be pointed out, however, that the trade demand in the early months of the year both in the United States and in this country has been disappointing on the whole and prices have tended downwards under more pressing offers in the southern markets, particularly in the first half of March. Subsequently there was a change of sentiment for the better, chiefly traceable to adverse weather reports from the turpentine belt and on the assumption that the new crop movement would set in considerably later than usual. Helped by the continuation of heavy rains, the market indicated more resistance at around 45s. 6d. for spot delivery, but there ensued a sharp break at the end of March on the sudden appearance of fine warm weather, which enabled crop operations to be initiated much earlier than had been anticipated. This evidently caused first hand holders to dispose of some of their old stocks, which resulted in a fall in prices of fully 3s. per cwt., down to about 42s. 6d., and thus nullified the effect of the persistent shrinkage in the London stocks. The general statistical position, all the same, seems healthy, as old stocks across

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.17	.16	.16	.16	Binoxiate, 300 lb bbls.....lb.	.16	.17	.16
.30	.30	.30	.30	Bisulfate, 100 lb kegs.....lb.	.....	.30	.30
.05½	.05½	.05½	.05½	Carbonate, 80-85% calc. 800 lb casks.....lb.	.05½	.05½	.05½
.09	.06½	.08½	.08½	Chlorate crystals, powder 112 lb keg wks.....lb.	.08½	.09	.09
.08½	.07½	.08½	.08½	Imported 112 lb kegs NY.....lb...	.07½	.07½	.07½
.05½	.05½	.05½	.05½	Chloride, crys bbls.....lb.	.05½	.05½	.05½
.28	.27	.27	.27	Chromate, kegs.....lb.	.27	.28	.28
.57½	.55	.55	.55	Cyanide, 110 lb. cases.....lb.	.55	.57½	.57½
.12	.11½	.11½	.11½	Metabisulfite, 300 lb. bbl...lb.	.12	.13	.13
.17	.16	.16	.16	Oxalate, bbls.....lb.	.20	.24	.24
.12	.11	.11	.11	Perchlorate, casks wks.....lb.	.11	.12	.12
.15½	.15	.15½	.14½	Permanganate, USP, crys 500 & 100 lb drs wks.....lb.	.16	.16½	.16½
.38	.37	.39	.37½	Prussiate, red, 112 lb keg...lb.	38	.40	.40
.18½	.18	.18	.18	Yellow, 500 lb casks.....lb.	.18½	.21	.21
.51	.51	.51	.51	Tartrate Neut, 100 lb keg..lb.	.....	.21	.51
.25	.25	.25	.25	Titanium Oxalate, 200 lb bbls .....lb.	.21	.23	.25
.....	.....	.....	.....	Propyl Furoate, 1 lb tins.....lb.	.....	5.00	5.00
.05	.04	.04	.04	Pumice Stone, lump bags.....lb.	.04	.05	.05
.06	.04½	.04½	.04½	250 lb bbls.....lb.	.04½	.06	.06
.03	.02½	.02½	.02½	Powdered, 350 lb bags.....lb.	.02½	.03	.03
.03½	.03½	3.75	3.75	Putty, commercial, tubs..100 lb.	.....	.03½	.03½
.07	.05½	5.50	5.50	Linseed Oil, kegs.....100 lb.	.....	.05½	.05½
1.50	1.50	3.00	1.50	Pyridine, 50 gal drums.....gal.	.....	1.75	1.75
.13	.13	.13	.12	Pyrites, Spanish cif Atlantic ports bulk.....unit	.13	.13½	.13½
.04	.03	.03	.03	Quebracho, 35% liquid tks....lb.	.03½	.04	.04
.04	.03½	.03½	.03½	450 lb bbls c-1.....lb.	.03½	.04½	.04½
.05	.04	.04	.04	35% Bleaching, 450 lb bbl .lb.	.04½	.05½	.04½
.05	.05	.05	.04½	Solid, 63%, 100 lb bales cif..lb.	.05½	.05½	.05½
.05	.05	.05	.05	Clarified, 64%, bales.....lb.	.....	.05½	.05½
.06	.05½	.06½	.06½	Quercitron, 51 deg liquid 450 lb bbls.....lb.	.05½	.06	.06
.13	.10	.10	.10	Solid, 100 lb boxes.....lb.	.10	.13	.13
14.00	14.00	14.00	14.00	Bark, Rough.....ton	.....	14.00	14.00
35.00	34.00	34.00	34.00	Ground.....ton	34.00	35.00	35.00
.46	.45	.45	.45	R Salt, 250 lb bbls wks.....lb.	.45	.46	.46
.....	.....	.18	.18	Red Sanders Wood, grd bbls..lb.	.....	.18	.18
1.35	1.25	1.25	1.25	Resorcinol Tech, cans.....lb.	1.15	1.25	1.25
.57	.57	.67	.57	Rosin Oil, 50 gal bbls, first run .....gal.	.....	.62	.62
.62	.62	.72	.62	Second run.....gal.	.....	.64	.64

Rosin

				Rosins 600 lb bbls 280 lb...unit			
9.75	8.20	13.00	8.50	B.....	.....	7.90	8.30
9.80	8.25	13.00	8.50	D.....	.....	8.05	8.65
9.95	8.60	13.15	8.50	E.....	.....	8.30	9.10
10.10	8.65	13.20	8.50	F.....	.....	8.40	9.30
10.10	8.75	13.25	8.50	G.....	.....	8.40	9.45
10.10	8.75	13.30	8.50	H.....	.....	8.40	9.50
10.15	8.80	13.35	8.55	I.....	.....	8.40	9.50
10.15	8.85	14.80	8.65	K.....	.....	8.45	9.55
10.30	8.85	15.00	8.80	M.....	.....	8.50	9.85
11.00	9.15	15.85	9.15	N.....	.....	8.90	10.30
11.65	10.15	16.60	10.50	WG.....	.....	9.15	11.30
12.65	10.40	18.55	12.00	WW.....	.....	9.70	12.30
30.00	24.00	24.00	24.00	Rotten Stone, bags mines....ton	24.00	30.00	30.00
.08	.07	.07	.07	Lump, imported, bbls.....lb.	.07	.08	.08
.12	.09	.09	.09	Selected bbls.....lb.	.09	.12	.12
.05	.02	.02	.02	Powdered, bbls.....lb.	.02	.05	.05
.05	.04½	.04½	.04½	Sago Flour, 150 lb bags.....lb.	.04½	.05	.05
.....	.....	.90	.90	Sal Soda, bbls wks.....100 lb.	.....	1.00	1.00
20.00	19.00	19.00	19.00	Salt Cake, 94-96% c-1 wks. .ton	19.00	20.00	20.00
17.00	15.00	15.00	15.00	Chrome .....ton	12.00	15.00	17.00
.06½	.06½	.06½	.06½	Saltpetre, double refd granular 450-500 lb bbls.....lb	.06½	.06½	.06½
.01½	.01½	.01½	.01½	Satin, White, 500 lb bbls.....lb	.....	.01½	.01½
.62½	.49	.66	47	Shellac Bone dry bbls.....lb.	.....	.58	.61
.55	.45	.57	.41	Garnet, bags.....lb.	.. ..	.45	.45
.58	.47	.65	40	Superfine, bags.....lb.	.46	.47	.47
.55	.42	.37	.57	T. N. bags.....lb.	.....	.43	.44
.57	.53	.50	.50	Schaeffer's Salt, kegs.....lb.	.53	.57	.57
11.00	8.00	6.00	6.00	Silica, Crude, bulk mines....ton	8.00	11.00	11.00
30.00	22.00	15.00	15.00	Refined, floated bags.....ton	22.00	30.00	30.00
.....	.....	32.00	32.00	Air floated bags.....ton	.....	32.00	32.00
40.00	32.00	55.00	55.00	Extra floated bags.....ton	32.00	40.00	40.00
22.00	15.00	15.00	15.00	Soapstone, Powdered, bags f. o. b. mines.....ton	15.00	22.00	22.00

Soda

				Soda Ash, 58% dense, bags c-1 wks.....100 lb.	.....	1.40	1.40
1.40	1.40	1.32½	1.32½	58% light, bags.....100 lb.	.....	1.34½	1.34½
2.29	2.40	2.14	2.04	Contract, bags c-1 wks.100 lb.	.....	1.32	1.32
1.32½	1.32½	1.32½	1.32½	Soda Caustic, 76% grnd & flake drums.....100 lb.	.....	3.35	3.35
4.21	4.16	4.16	4.06	76% solid drs.....100 lb.	.....	2.95	2.95
3.91	3.76	3.76	3.66	Contract, c-1 wks.....100 lb.	.....	2.90	2.90
3.00	3.00	3.00	3.00	Sodium Acetate, crystals, 450 lb. bbls wks.....lb.	.05½	.06½	.06½
.05	.04½	.04½	.04½	Arsenate, drums.....lb.	.18	.19	.19
.....	.....	.19	.18	Arsenite, drums.....gal.	1.00	1.50	1.50
.....	.....	1.00	1.00	Bicarb, 400 lb bbl NY..100 lb.	.....	2.41	2.41
2.41	2.41	2.41	2.41				

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Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

the Atlantic had been reduced to relatively low dimensions by the time the new crop movement got under way. Consumers there would appear to have allowed their reserves to fall to a low ebb, and it is not surprising, therefore, that they have lately displayed more interest in providing for their needs over the spring period. The American market, moreover, is apt to derive some benefit from the fact that imports by this country will become inevitable before another month has elapsed.

Valonia — Cups have advanced somewhat and are now quoted at $32.00 per ton, while other grades remain unchanged.

OILS AND FATS

Chinawood Oil — Prices at the Coast have fallen off during the past month so that tanks are now at 13¼c lb., ½c lb. lower than when last reported. Tanks at New York are also lower at 13⅝c lb., although prices on barrels are unchanged. The lower prices are attributed to the fact that demand has been rather quiet. Total exports of wood oil from Hankow during May amounted to 11,099,840 pounds, of which 9,888,000 pounds went to the United States and 1,211,840 pounds to Europe. Unsold stocks at Hankow at the end of May were estimated at approximately 2,400 short tons, of which some is reported not to be up to export standard, by the Department of Commerce. Total exports from Hankow to the United States during the first five months of this year amount to 37,765,465 pounds, which compares with 36,477,595 pounds for the same period of last year. The exports of 9,888,000 pounds during May to the United States compare with 6,722,000 pounds during April and 11,740,960 pounds during May of 1928. Total exports of wood oil from Shanghai during the first quarter of this year amounted to 366,000 pounds, valued at $46,725, as compared with 1,005,315 pounds, valued at $128,438, for the same period of 1928.

Coconut Oil — The end of the past month witnessed some slight improvement in this market due probably to the fact that the excess stocks which had been prevalent for some time, were slowly being disposed of. At any rate the market took on a firmer appearance, with copra stronger.

Corn Oil — Prices have fallen off considerably during the past month so that crude oil is now at 7⅞c lb. in tanks, and 9½c lb. in barrels. Refined oil is also

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.07	.06½	.06½	.06½	Bichromate, 500 lb cks wks .lb.	.07½	.07¾	.07¾	.07½
.04	.04	.08½	.08½	Bisulfite, 500 lb bbl wks....lb.	.....	.04	.04	.04
1.35	1.30	1.30	1.30	Carb. 350 lb bbls NY..100 lb.	1.30	1.35	1.35	1.30
.06¾	.05¾	.06½	.06½	Chlorate, 112 lb kegs wks..lb.	.09	.09½	.09½	.06½
13.00	12.00	12.00	12.00	Chloride, technical.....ton	12.00	13.00	13.00	12.00
.20	.20	.20	.20	Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.	.18	.20	.20	.18
.09	.08¾	.08¾	.08¾	Fluoride, 300 lb bbls wks...lb.	.08¾	.09	.09	.08¾
.24	.22	.22	.22	Hydrosulfite, 200 lb bbls f. o. b. wks.....lb.	.22	.24	.24	.22
.05	.05	.05	.05	Hypochloride solution, 100 lb cbys.....lb.	.....	.05	.05	.05
3.05	2.65	2.65	2.65	Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.65	3.05	3.05	2.65
2.65	2.40	2.40	2.40	Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.65	2.40
.45	.45	.70	.45	Metanilate, 150 lb bbls.... lb.	.....	.45	.45	.45
.....	.....	.02½	.02½	Monohydrate, bbls.....lb.	.....	.02½	.02½	.02½
.57	.55	.55	.55	Naphthionate, 300 lb bbl...lb.	.55	.57	.57	.55
2.45	2.12½	2.67	2.25	Nitrate, 92%, crude, 200 lb bags c-1 NY.....100 lb.	.....	2.10	2.22½	2.10
.08½	.07½	.08½	.08	Nitrite, 500 lb bbls spot....lb.	.07½	.08	.08	.07½
.27	.25	.25	.25	Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.27	.25
.23	.20	.20	.20	Oxalate Neut, 100 lb kegs..lb.	.37	.42	.42	.37
3.90	3.90	3.90	3.90	Paratoluene, tri-sodium, tech. 100 lb bbls c-1....100 lb.	.....	3.90	3.90	3.90
.09	.08	.08	.08	Sulfonate, 175 lb bbls....lb.	.08	.09	.09	.08
.22	.21	.21	.21	Perborate, 275 lb bbls.....lb.	.18	.20	.22	.18
3.55	3.25	3.25	3.25	Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	3.25	3.55	3.55	3.25
.....	....	.....	.....	tri-sodium, tech, 325 lb bbls.....100 lb.	3.90	4.00	4.00	3.90
.72	.69	.69	.69	Picramate, 100 lb kegs.....lb.	.69	.72	.72	.69
.12½	.12	.12	.11	Prussiate, Yellow, 350 lb bbl wks.....lb.	.12	.12½	.12½	.12
.14	.13½	.13½	.13½	Pyrophosphate, 100 lb keg..lb.	.15	.20	.20	.15
1.45	1.20	1.20	1.20	Silicate, 60 deg 55 gal drs, wks .....100 lb.	.....	1.65	1.65	1.65
1.10	.85	.85	.85	40 deg 55 gal drs, wks .....100 lb.	.70	.80	.80	.70
.05	.05	.04½	.04½	Silicofluoride, 450 lb bbls NY .....lb.	.05½	.05½	.05½	.05
.49	.48½	.48½	.48½	Stannate, 100 lb drums....lb.	.41½	.42	.43	.41½
.29	.18	.20	.20	Stearate, bbls.....lb.	.25	29	.29	.25
.18	.16	.16	.16	Sulfanilate, 400 lb bbls.....lb.	.16	.18	.18	.16
.02½	.02½	.02½	.02½	Sulfate Anhyd, 550 lb bbls c-1 wks.....lb.	.02½	.02½	.02½	.02½
.02½	.02½	.02½	.02½	Sulfide, 30% crystals, 440 lb bbls wks.....lb.	.02½	.02½	.02½	.02½
.04	.03½	.03½	03½	62% solid, 650 lb drums 1c-1 wks.....lb	.03½	.04	.04	.03½
.03½	.03½	.03½	.03½	Sulfite, crystals, 400 lb bbls wks.....lb.	.03½	.03½	.03½	.03½
.50	.40	.40	.40	Sulfocyanide, bbls.....lb.	.66	.76	.76	.66
.85	.80	.85	.80	Tungsten, tech, crystals, kegs .....lb.	.80	.85	.85	.80
.40	.35	.40	.35	Solvent Naphtha, 110 gal drs wks.....gal.	.35	.40	.40	.35
.01½	.01½	.01½	.01½	Spruce, 25% liquid, bbls.....lb.	.....	.01½	.01½	.01½
.01	.01	.01	.01	25% liquid, tanks wks.....lb.	.....	.01	.01	.01
.02½	.02	.02	.02	50% powd, 100 lb bag wks lb.	.02	.02½	.02½	.02
4.42	3.07	3.22	3.07	Starch, powd., 140 lb bags .....100 lb.	3.82	4.02	4.02	3.82
4.32	2.97	3.12	2.97	Pearl, 140 lb bags.....100 lb.	3.72	3.92	3.92	3.72
.06½	.05½	.06	.04½	Potato, 200 lb bags.....lb.	.05½	.06½	.06½	.05½
.06½	.05½	.06½	.06½	Imported bags.....lb.	.05½	.06½	.06½	.05½
.08½	.08	.08	.06	Soluble.....lb.	.08	.08½	.08½	08
.10	.09½	.09½	.09	Rice, 200 lb bbls.....lb.	.09½	.10	.10	.09½
.07	.06½	.06½	.06½	Wheat, thick bags.....lb.	.06½	.07	.07	.06½
.10	.09½	.09½	.09½	Thin bags.....lb.	.09½	10	.10	.09½
.07½	.07½	.07½	.07½	Strontium carbonate, 600 lb bbls wks.....lb.	.07½	.07½	.07½	.07½
.09	.08½	.08½	.08	Nitrate, 600 lb bbls NY....lb.	.09	.09½	.09½	.08½
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25	1.25

Sulfur

2.05	2.05	2.05	2.05	Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	2.05	2.05
19.00	18.00	18.00	18.00	Crude, f. o. b. mines.....ton	18.00	19.00	19.00	18.00
2.40	2.40	2.40	2.40	Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	2.40	2.40
2.50	2.50	2.50	2.50	Heavy bags c-1.....100 lb.	.....	2.50	2.50	2.50
3.45	3.45	3.45	3.45	Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.	.....	3.45	3.45	3.45
2.85	2.65	2.65	2.65	Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.85	2.65
.05½	.05	.05	.05	Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05½	.05
.04½	.03½	.03¾	.03½	Yellow, 700 lb drs wks.....lb.	.03½	.04½	.04½	.03½
.08½	.08	.08	.08	Sulfur Dioxide, 150 lb cyl....lb.	.08	.08½	.08½	.08
.19	.17	.17	.17	Extra, dry, 100 lb cyl.....lb.	.17	.19	.19	.17
.65	.10	.65	.65	Sulfuryl Chloride, 600 lb dr...lb.	.10	.65	.65	.10
.11½	.11	.11	.11	Stainless, 600 lb bbls....lb.	.11	.11½	.11½	.11
.06	.05½	.05	.05	Extract, 450 lb bbls.....lb.	.05½	.06	.06	.05½
130.00	130.00	130.00	130.00	Sicily Leaves, 100 lb bg...ton	.....	130.00	130.00	130.00
72.00	72.00	80.00	72.00	Ground shipment.....ton	.....	72.00	72.00	72.00
60.00	55.00	55.00	55.00	Virginia, 150 lb bags.....ton	55.00	60.00	60.00	55.00
15.00	12.00	12.00	12.00	Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	15.00	12.00
18.00	16.00	16.00	16.00	Refined, 100 lb bgs NY..ton	16.00	18.00	18.00	16.00
35.00	30.00	30.00	30.00	French, 220 lb bags NY...ton	20.00	25.00	25.00	20.00
45.00	38.00	38.00	38.00	Refined, white, bags....ton	38.00	45.00	45.00	38.00
50.00	40.00	40.00	40.00	Italian, 220 lb bags NY...ton	40.00	50.00	50.00	40.00
55.00	50.00	50.00	50.00	Refined, white, bags....ton	50.00	55.00	55.00	50.00
				Superphosphate, 16% bulk, wks.....ton	.....	10.00	10.00	9.00

SYNTHETIC NITROGEN COMPOUNDS

KUTTROFF PICKHARDT KUTTROFF PICKHARDT KU

AMMONIUM BICARBONATE

AMMONIUM CARBONATE

AMMONIUM CHLORIDE

AMMONIUM NITRATE

POTASSIUM NITRATE
SODIUM NITRATE
SODIUM NITRITE
SAL AMMONIAC
UREA A

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Bay City, Michigan

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - June 1929 $1.03

lower at 9c lb. in tanks and 10½c lb. in barrels.

Cottonseed Oil — Has held at about the same level as reported last month with PSY at 9.5c lb. and futures averaging about 9.6c lb. The general tone of the market has been a steady one during the month. Cotton seed crushings for the ten months ended with May totaled 4,944,032 tons, against 4,581,832 tons for the same period a year ago, according to figures compiled to-day by the Census Bureau. Receipts during the period were 5,026,633 tons against 4,542,997 tons, and stocks on hand at mills May 31, totaled 100,634 tons against 50,449 tons last year.

Cotton seed products manufactured during the ten months' period included 1,563,241,392 pounds of crude oil, against 1,451,852,578 pounds a year ago; 1,389,390,030 pounds of refined oil, against 1,263,305,363 pounds. Exports of cotton seed products during the nine months ended April 30 included 18,954,727 pounds of crude oil, compared with 46,595,191 pounds in the same period a year ago; 6,860,149 pounds of refined oil, against 8,043,909 pounds; 265,520 tons of cake and meal, against 304,043 tons, and 152,521 running bales of linters, against 156,280 bales.

Linseed Oil — Has advanced two points during the past month and is now quoted at 9.7c lb. in tanks, 10.5 lb. in barrels, and 10.9c lb. in five-barrel lots. The market has been firm and characterized by steady business. Reports from Minneapolis estimate an increase in the flaxseed acreage of the four Northwestern states of 11.9 per cent over the acreage of a year ago, or a total to harvest of 2,969,000 acres. In twelve other states, acreage is estimated at 61,000. From this, there will be the usual loss from frost, cut worms and weeds.

Olive Oil — Demand has improved somewhat during the past month and prices have advanced accordingly so that denatured is now quoted at $1.35 @ $1.40 gal. Foots holds about the same level at 10c @ 10¼c lb.

Palm Oil — Both grades have declined considerably in price during the past month, so that Lagos is now quoted at 7½c lb. and Niger at 7¼c lb. This represents a decline of ¾c lb. during the month, due chiefly to conditions in the tallow market which has offered large quantities for sale, resulting in lowered prices.

Perilla Oil — Has been in fairly good demand with Coast tanks held at 13¼c lb. Barrels, New York, are now at 15½c lb.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
5.10&10	4.65&10	4.85	4.00	Tankage Ground NY.....unit	..... 4.00&10	4.75&10	4.00&10
4.80&10	3.90&10	5.25	3.75	High grade f.o.b. Chicago.unit	..... 3.75&10	4.80&10	3.75&10
5.00&10	4.60&10	5.25	4.00	South American cif.....unit	..... 4.35&10	4.80&10	4.35&10
.05	.04½	.04½	.04½	Tapioca Flour, high grade bgs.lb.	.04½	.05	.05	.04½
.04	.03½	.03½	.03½	Medium grade, bags.....lb.	.03¾	.04	.04	.03¾
.27	.26	.26	.26	Tar Acid Oil, 15%,drums....gal.	.26	.27	.27	.26
.30	.29	.29	.29	25% drums.....gal.	.29	.30	.30	.29
.08	.07	.07	.07	Coke Oven, tanks wks.....lb.	.07	.08	.08	.07
13.50	13.50	16.00	13.50	Kiln Burnt, bbl.....bbl.	.....	13.50	13.50	13.50
15.00	13.50	18.50	13.50	Retort, bbls.....bbl.	13.50	15.00	15.00	13.50
1.75	1.15	1.15	1.15	Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.75	1.15
2.00	1.50	1.50	1.50	No. 2 bags or bbls...100 lb.	1.50	2.00	2.00	1.50
.02½	.02	2.00	2.00	Imported bags.....100 lb.	.02	.02½	.02½	.02
.....	.....	.....	.....	Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09½	.09
.20	.20	.20	.20	Tetralene, 50 gal drs wks.....lb.	.....	.20	.20	.20
.24	.22	.22	.22	Thiocarbanilid, 170 lb bbl....lb.	.22	.24	.24	.22
.17½	.14½	.20½	.17½	Tin Bichloride, 50% soln, 100 lb bbls wks.....lb.	.....	.14	.14½	.14
.41½	.36½	.48	.41½	Crystals, 500 lb bbls wks...lb.	.....	.34½	.36½	.34½
.58	.48	.71½	.58	Metal Straits NY.....lb.	.....	.43½	.48	.43½
.75	53	.75	.70	Oxide, 300 lb bbls wks.....lb.	.....	.49	.56	.49
.35½	.30½	.48	.35½	Tetrachloride, 100 lb drs wks. .....lb.	.....	.28½	.30½	.28½
.40	.40	.40	.40	Titanium Oxide300 lb bbl....lb.	.....	.24	.40	.24
.14	.13½	.13½	.13½	Pigment, bbls.....lb.	.08½	.09	.14	.08½
.45	40	.40	.40	Toluene, 110 gal drs.....gal.	.....	.45	.45	.45
.45	.35	.35	.35	8000 gal tank cars wks....gal.	.....	.40	.40	.40
.94	.90	.90	.90	Toluidine, 350 lb bbls.....lb.	.90	.94	.94	.90
.32	.31	.31	.31	Mixed, 900 lb drs wks.....lb.	.31	.32	.32	.31
.90	.85	.85	.85	Toner Lithol, red, bbls.....lb.	.90	.95	.95	.85
.80	.70	.75	.75	Para, red, bbls.....lb.	.....	.80	.80	.70
1.80	1.70	1.75	1.75	Toluidine .....lb.	1.50	1.55	1.55	1.50
3.90	3.60	3.60	3.60	Triacetin, 50 gal drs wks.....lb.	3.60	3.90	3.90	3.60
.....	.....	.....	.....	Trichlorethylene, 50 gal dr...lb.	.10	.10½		
.....	.....	.....	.....	Triethanolamine, 50 gal drs....lb.	.55	.60	.60	.55
.50	.36	.36	.36	Tricresyl Phosphate, drs.....lb.	.33	.45	.45	.33
.73	.69	.70	.69	Triphenylguanidine.....lb.	.58	.60	.70	.58
.75	.70	.70	.70	Phosphate, drums.....lb.	.70	75	.75	.70
3.00	2.50	2.50	2.50	Tripoli, 500 lb bbls.....100 lb.	1.75	2.00	2.00	1.75
.66½	.50½	.86	.53½	Turpentine Spirits, bbls.....gal.	.51½	.57	.65	.51½
.59	.46	.76	.46	Wood Steam dist. bbls....gal.	.....	.49	.57	.49
.20	.18	.18	.18	Urea, pure, 112 lb cases.....lb.	.20	.30	.30	.20
				Fert. grade, bags.....ton	.....	165.00	165.00	165.00
				c. i. f. S. points.....ton	.....	108.15	108.15	108.15
76.00	55.00	70.00	66.00	Valonia Beard, 42%, tannin bags.....ton	.....	50.00	55.00	50.00
55.00	58.00	49.50	39.00	Cups, 30-31% tannin.....ton	.....	32.00	35.00	31.00
64.00	45.00	68.00	43.00	Mixture, bark, bags.....ton	.....	37.00	43.00	37.00
2.10	1.75	1.95	1.55	Vermillion, English, kegs....lb..	2.00	2.05	2.05	2.00
.....	.....	.....	.....	Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	1.00	1.00
76.00	49.75	59.00	49.50	Wattle Bark, bags.....ton	43.50	45.00	49.75	43.50
.06½	.05½	.05½	.05½	Extract 55%, double bags ex-dock.....lb.	.....	.06½	.06½	.06½
				Whiting, 200 lb bags, c-1 wks .....100 lb.	.....	1.25	1.25	1.25
1.25	1.25	1.25	1.25					
13.00	13.00	13.00	13.00	Alba, bags c-1 NY.....ton	.....	13.00	13.00	13.00
1.35	1.35	1.35	1.35	Gilders, bags c-1 NY...100 lb.	.....	1.35	1.35	1.35

Zinc

.05½	5.85	.06½	.06½	Zinc Ammonium Chloride powd., 400 lb bbls.....lb.	5.25	5.75	5.75	5.25
.10	.09½	.09½	.09½	Carbonate Tech, bbls NY..lb.	.10½	.11	.11	.10½
.06	.06	.06	.06	Chloride Fused, 600 lb drs. wks.....lb.	.05½	.06	.06	.05½
.06½	.06½	.06½	.06½	Gran., 500 lb bbls wks.....lb.	.06½	.06½	.06½	.06½
3.00	3.00	3.00	3.00	Soln 50%, tanks wks...100 lb.	.....	3.00	3.00	3.00
.41	.40	.40	.40	Cyanide, 100 lb drums.....lb.	.40	.41	.41	.40
				Dithiofuroate, 100 lb dr....lb.	.....	1.00	1.00	1.00
.09	.09	.09	.09	Dust, 500 lb bbls c-1 wks...lb.	.08½	08½	.08½	.08½
6.40	6.07½	7.35	6.40	Metal, high grade slabs c-1 NY.....100 lb.	.....	6 45	6.45	6.45¼
.07½	.07½	.07½	.07½	Oxide, American bags wks..lb.	.07½	.07½	.07½	.07
.12½	.10½	.10½	.10½	French, 300 lb bbls wks...lb.	.09½	.11½	.11½	.09½
.....	.....	.....	.....	Perborate, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Stearate, 50 lb bbls.....lb.	.25	.26	.26	.25
.03½	.03½	.03½	.03	Sulfate, 400 bbl wks.....lb.	.03½	.03½	.03½	.03½
.32	.30	.30	.30	Sulfide, 500 lb bbls.....lb.	.30	.32	.32	.30
.30	.29	.29	.29	Sulfocarbolate, 100 lb keg..lb.	.29	.30	.30	.29
.32	.32	.38	.32	Xylene, 10 deg tanks wks...gal.	.....	.33	.33	.33
.32	.30	.36	.30	Commercial, tanks wks...gal.	.30	.32	.32	.30
.38	.38	.35	.35	Xylidine, crude.....lb.	.....	.38	.38	.38
.03	.02½	.02½	.02½	Zirconium Oxide, Nat. kegs..lb.	.02½	.03	.03	.02½
.50	.45	.45	.45	Pure kegs.....lb.	.45	.50	.50	.45
.10	.08	.08½	.08	Semi-refined kegs.....lb.	.08	.10	.10	.08

Oils and Fats

.14½	.13	.14	.13	Castor, No. 1, 400 lb bbls.....lb.	.13	.13½	.13½	.13
.14	.12½	.14	.12½	No. 3, 400 lb bbls.....lb.	.12½	.13	.13	.12½
.17	.14	.18	.17	Blown, 400 lb bbls.....lb.	.14	.15	.15	.14
.17	.14½	.31	.13½	China Wood, bbls spot NY...lb.	.14½	.15	.15½	.14½
.14½	.14½	.18	.12½	Tanks, spot NY.....lb.	....	.13½	.13½	.13½
.14½	.12½	.....	.....	Coast, tanks, May.....lb.	.....	.13½	.14½	.12½
.11½	.10½	.12	.12	Cocoanut, edible, bbls NY....lb.	.....	.10½	.10½	.10¾
.10	.09½	.09½	.09	Ceylon, 375 lb bbls NY....lb.	.08	.08½	.09½	.08
.09	.08½	.08½	.08	8000 gal tanks NY.....lb.	.07½	.07½	.08½	.07½
.10½	.09½	.10½	.09½	Cochin, 375 lb bbls NY....lb.	.....	.09½	.10	.09½
.09½	.08½	.10	.08½	Tanks NY.....lb.	.08½	.09	.09½	.08½
.10	.08½	.09½	.08½	Manila, bbls NY.....lb.	.08	.08½	.09½	.08
.08½	.08	.08½	.08½	Tanks NY.....lb.	.07½	.07½	.08½	.07½
.08½	.07½	.08½	.08	Tanks, Pacific Coast.....lb.	.06½	.06½	.08	.06½

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1829 $1.047 - June 1929 $1.03

Red Oil — Has continued to decline in price with a slackening of demand, so that distilled in barrels is now quoted at 10⅜c @ 10⅞c lb., while tanks are at 9¼c lb.

Soy Bean Oil — Domestic oil at the Mid-Western mills has declined further to 8¼c lb., and with every evidence of supply sufficient to care for domestic needs, has replaced the imported material in the domestic market. Imported oil is still quoted nominally at 9c lb. in tanks at the Coast and on that basis cannot of course compete.

Stearic Acid — All grades have declined ¼c lb. during the past month due to lower raw material costs combined with some slackening in demand. Double pressed distilled is now at 15¼c @ 15¾c lb., double pressed saponified at 15¾ @ 16¼c lb., and triple pressed distilled at 17¾c @ 18¼c lb.

Tallow — Supplies of material has been plentiful during the past month, and as a result prices have declined considerably and had their effect upon all the soap group. Now quoted at 7c lb., while edible is at 8c @ 8¼c lb.

Tallow Oil — In common with most of the animal group has declined during the month and is now quoted at 9¾c lb. in tanks and 10¾c lb. in barrels.

Whale Oil — The whaling season 1928-29 has now practically closed. The total production of Norwegian companies in the Antarctic is estimated at 1,200,000 barrels, while the total Norwegian catch in 1927-28, including Africa, Mexico, etc., was 845,884 barrels. The world production of whale oil, season 1927-28, was about 1,342,000 barrels. Of next season's production 120,000 barrels have been sold in advance on a kind of sliding scale contract, and there is a further offer to buy 250,000 barrels at a price of £25 per ton. It is, comments the Norwegian journal "Hvalnytt," of course too early yet to form an opinion as to whether this will be the price for the greater part of next season's production, but the position being what it is, we shall undoubtedly have to reckon with a considerable drop in prices. A new and enlarged whaling association, to be called Hvalfangerforeningen, was formed in the place of Den Norske Hvalfangerforening at a meeting held in Sandefjord on May 11. The new association consists of 24 Norwegian and five foreign companies, and admission to membership still remains open. At the meeting referred to a committee was appointed with the object of organizing a ring of sellers of whale oil.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cod, Newfoundland, 50 gal bbls			
.69	.63	.66	.63	.....gal.	.63	.64	.63
.63	.60	.59	.59	Tanks NY.....lb.	.....	.60	.60	.60
				Cod Liver see Chemicals.....			
.06½	.05½	.06	.06	Copra, bags.....lb.	.....	.042	.05½	.042
.11	.10	.11	.07	Corn, crude, bbls NY.....lb.	.....	.09½	.10¾	.09½
.10	.08½	.09½	.07	Tanks, mills.....lb.	.....	.07½	.09½	.07½
.12½	.11½	.14	.10½	Refined, 375 lb bbls NY....lb.	.....	.10½	.11½	.10½
.11½	.10½	.12	.11	Tanks.....lb.	.....	.09	.11	.09
.09½	.07½	.09½	.06½	Cottonseed, crude, mill.....lb.	.....	Nom.	.09	.08½
10.65	.09½	.11½	.08 1/5	PSY 100 lb bbls spot.....lb.	.....	.095	.1075	.095
10.75	.09½	.....	.....	Aug.—Oct.....lb.	.....	.096	.1080	.096
				Degras, American, 50 gal bbls			
.05	.04½	.04½	.04½	NY.....lb.	.04½	.05	.05	.04½
.05½	.04½	.04½	do	English, brown, bbls NY....lb.	.....	.05½	.05½	.05½
.05½	.05½	.05½	.05½	Light, bbls NY.....lb.	.....	.05½	.05½	.05½
				Greases			
.08½	.07	.07½	.06	Greases, Brown.....lb.	.....	.06	.08½	.06
.08½	.07	.08	.06½	Yellow.....lb.	.....	.06½	.08½	.06½
.11	.09½	.10½	.08½	White, choice bbls NY.....lb.	.....	.08½	.11½	.07½
.42½	.40	.....	.....	Herring, Coast, Tanks.....gal.	.....	Nom.		
Nom.	.09½	.09½	.09	Horse, bbls.....lb.	.09½	Nom.	Nom.	.....
.16½	.15½	.16½	.14½	Lard Oil, edible, prime.....lb.	.....	.15	.15½	.15
.13½	.12	.13½	.10½	Extra, bbls.....lb.	.....	.12½	.13½	.12½
.13	.11	.12½	.10½	Extra No. 1, bbls.....lb.	.....	.12	.13½	.12
10.8	10.0	.11 4/5	.10 2/5	Linseed, Raw, five bbl lots...lb.	.....	.109	.109	.105
10.4	9.6	.11 9/10	.09 6/10	Bbls c-l spot.....lb.	.....	.105	.105	.101
9.6	8.8	.10½	.09	Tanks.....lb.	.....	.097	.097	.093
.09½	.09½	.09½	.09½	Lumbang, Coast.....lb.	.....	.09½	.09½	.09½
.48	.40	.47½	.44	Menhaden Tanks, Baltimore.gal.	.....	.52	.52	.52
.09	.09	.90	.10	Blown, bbls NY.....lb.	.....	.09	.09	.09
.70	.67	.70	.67	Extra, bleached, bbls NY..gal.	.....	.70	.70	.70
.64	.63	.66	.63	Ligh, pressed, bbls NY....gal.	.63	.64	.64	.63
.67	.66	.66	.69	Yellow, pressed, bbls NY..gal.	.66	67	.67	.66
				Mineral Oil, white, 50 gal bbls			
.60	.40	.....	.....	.....gal.	.40	.60	.60	.40
1.00	.95	.....	.....	Russian, gal.....gal.	.95	1.00	1.00	.95
.19	.18½	.18½	.14½	Neatsfoot, CT, 20° bbls NY..lb.	.....	.18½	.19	.18½
.13½	.12	.13½	.10½	Extra, bbls NY.....lb.	.....	.12½	.13½	.12½
.16½	.15½	.16½	.12½	Pure, bbls NY.....lb.	.....	.13½	.15½	.13½
.17½	.11½	.18½	.10	Oleo, No. 1, bbls NY.....lb.	.....	.10½	.11½	.10½
.15½	.11	.17	.08½	No. 2, bbls NY.....lb.	.....	.10½	.11½	.10½
.14	.10	.14	.08½	No. 3, bbls NY.....lb.	.....	.10	.10½	.10
1.40	1.18	1.75	1.40	Olive, denatured, bbls NY...gal.	1.35	1.40	1.40	1.25
2.00	1.75	2.00	2.45	Edible, bbls NY.....gal.	1.95	2.00	2.00	1.95
.11	.09½	.10½	.08½	Foots, bbls NY.....lb.	.10	.10½	.11½	.10
.09½	.08½	.09½	.09	Palm, Kernel, Casks.....lb.	.....	.08	.09	.08
.09½	.07½	.08½	.07½	Lagos, 1500 lb casks.....lb.	.....	.07½	.09	.07½
.08½	.07	.08½	.07½	Niger, Casks.....lb.	.....	.07½	.08½	.07½
.12½	.12	.14½	.12	Peanut, crude, bbls NY.....lb.	.....	Nom.	Nom.	.....
.17	.14½	.15½	.14½	Refined, bbls NY.....lb.	.14½	.15	.15	.14½
.21	.13	.16½	.12½	Perilla, bbls NY.....lb.	.....	.15½	.20	.15½
.15½	.10½	.14½	.10	Tanks, Coast.....lb.	.....	.13½	.14½	.13½
1.75	1.70	1.70	1.70	Poppyseed, bbls NY.....gal.	1.70	1.75	1.75	1.70
1.06	1.01	1.05	1.00	Rapeseed, blown, bbls NY...gal.	1.04	1.04	1.04	1.04
.92	.83	.90	.82	English, drms. NY.....gal.	.85	.90	.90	.85
.90	.81	.85	.76	Japanese, drms. NY.....gal.	.80	.84	.88	.80
.10½	.09½	.10	.09	Red, Distilled, bbls.....lb.	.10½	.10½	.11½	.10½
.09½	.08	.09½	.08½	Tanks.....lb.	.....	.09½	.10½	.09½
.5-	.42	.50	.50	Salmon, Coast, 8000 gal tks..gal.	.42	.44	.44	.42
.50	.41	.47	.43	Sardine, Pacific Coast tks...gal.	.....	.45	.51	.45
.13½	.12	.13	.11½	Sesame, edible, yellow, dos...lb.	.11½	.12	.12	.11½
.15	.12½	.14	.14	White, dos.....lb.	.12½	.12½	.12½	.12½
.40	.40½	.40	.40	Sod, bbls NY.....gal..	.....	.40	.40	.40
.....	.....	.09½	.09½	Soy Bean, crude.....				
.09½	.09	.....	.....	Pacific Coast, tanks.....lb.	.....	.09	.10	.09
				Domestic tanks, f.o.b. mills, ...lb.	.....	.08½	.08½	.08½
.12½	.12	.12½	.10½	Crude, bbls NY.....lb.	.....	.11½	.12½	.11½
.10½	.10½	.11	.10½	Tanks NY.....lb.	.....	Nom.	.10½	.10½
.13½	.13½	.13	.12	Refined, bbls NY.....lb.	.13½	.13½	.13½	.13½
.85	.84	.85	.84	Sperm, 38° CT, bleached, bbls NY.....gal.	.84	.85	.85	.84
.80	.79	.82	.79	45° CT, bleached, bbls NY gal.	.79	.80	.80	.79
.18½	.11	.13½	.11½	Stearic Acid, double pressed dist bags.....lb.	.15½	.15½	.18½	.15½
.19	.11½	.14	.11½	Double pressed saponified bags .....lb.	.15½	.16½	.19	.15½
.20½	.13½	.15½	.13½	Triple, pressed dist bags..lb	.17½	.18½	20½	.17½
.12½	.09½	.13	.08½	Stearine, Oleo, bbls.....lb.	.....	.09½	.12	.09½
.09½	.08½	.09	.07½	Tallow City, extra loose.....lb.	.....	.07	.08½	.07
.10½	.09½	.11	.08½	Edible, tierces.....lb.	.08	.08½	.10½	.08
.12½	.11½	.10½	.08½	Tallow Oil, Bbls, c-1 NY...lb.	.....	.10½	.12	.10½
.11½	.10½	.12½	.10	Acidless, tanks NY.....lb.	.....	.09½	.11	.09½
Nom.	.08	.08½	.07½	Vegetable, Coast mats.....lb.	.08	Nom.	Nom.	.08
.11	.....	.11	.11	Turkey Red, single bbls.....lb.	.11	.12	.12	.11
.16	.14	.14	.14	Double, bbls.....lb.	.14	.16	.16	.14
.80	.78	.78	.78	Whale, bleached winter, bbls NY.....gal.	.78	.80	.80	.78
.82	.80	.80	.80	Extra, bleached, bbls NY..gal.	.80	.82	.82	.80
78	.76	.76	.76	Nat. winter, bbls NY.....gal.	.76	.78	.78	.76

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"WE"—Editorially Speaking

Right through the very heart of the Allied Air Nitrogen plant runs a street which bears the tactless name of Du Pont Avenue. The City Fathers of Hopewell, Va., might very gracefully remove this reminder of other days by a rechristening party at which, in recognition of our public service to the community, we might properly be asked to officiate as god-father. As a neutral and liberal minded sponser we should like to suggest Nichols Street, or if this seems too prosaic, Orlando Terrace would rouse the envy of the seventy-seven realtors who have carefully staked out subdivisions for development several miles in all directions surrounding "Virginia's famous inland port." If this seems too fanciful a name for such a distinctly industrial thoroughfare, we would waive our copyright and suggest Chemical Market Place.

To Harry L. Derby, president of Kalbfleisch, are due our apologies. In the title of his article on a new scheme for administering a flexible tariff, which we published last month, we credited him with being *vice*-president of his own organization. On three counts, at least, the soubriquet vice is quite inapplicable to him.

Our article on nitrogen for this month is by Dr. Sidney Haskell and Henry Mahle of the Synthetic Nitrogen Products Corp. Previous to his connection with this company, Dr. Haskell was in charge of one of the Massachusetts Experiment Stations. He was among those present at the International Nitrogen Cruise on the Adriatic last year and is familiar with conditions in this country and abroad, where he is now on a business trip.

The Fergusson family has been for two notable generations intimately connected with the Philadelphia chemical trade and Alex C. Fergusson, Jr., is plainly an ideal recorder of anecdotes of the old-timers in the "City of Brotherly Love."

We can think of any number of bold headlines we might insert over the next item. Among them would be—"Future executives take note," "Is your office boy after your job," and "How to become a chemical executive over night." However, we leave you to write your own caption after carefully considering the following from a valued subscriber who writes:

"Ever quick to criticize, may I be equally prompt in offering an apology. I have finally discovered the mystery of the lost CHEMICAL MARKETS which should come to my desk each month. Apparently our office boy has taken a fancy to your valued publication and has been appropriating the issues for his own intellectual refreshment. Such discrimination cannot be censured. I have therefore, gently requested that when he finishes the perusal of the much fought-over journal that he place it on my desk."

Dr. Lore A. Rogers, who discusses dairy products as a source of raw materials for the chemical industry, has been in turn, assistant bacteriologist, New York Experiment Station, Geneva, N. Y., dairy bacteriologist, United States Department of Agriculture, since 1902, and is now in charge of the Dairy Research Laboratories of the Bureau of Dairy Industries of that department of the government. He holds honorary degrees from the University of Maryland and the University of Maine, was chairman of the program committee of the World's Dairy Congress in 1923, and is a member of the Society of American Bacteriologists (president, 1923), the American Public Health Association, the Dairy Science Association, Washington Academy Sciences, and Kappa Sigma. Obviously he knows his milk.

Dr. Lewis H. Marks, proponent of the modern trade institute, was educated as a physician and his first big work was to take charge of the Emergency Hospital at New Orleans during the yellow fever epidemic of 1905. He then went to Germany and after a few years was appointed a member of the Royal Institute of Experimental Therapeutics, being the first foreigner and the youngest man ever appointed to this position in Germany. He resigned in 1912 to become director of the Institute for Medical Research, which was founded in Frankfort for him by a group of American philanthropists. This work was brought to a halt by the War and Dr. Marks returned to this country in 1917. Then followed some years with National Aniline and general consulting practice and more recently his position as executive secretary of the Industrial Alcohol Institute. He is a member of Phi Rho Sigma, and has been decorated by the Governments of Spain, Germany, and Austria.

Although we have done our best, we have not wholly succeeded in disguising the fact that Mr. Charles W. Cuno, who tells "Where to Build the New Plant," is from St. Louis. He is consulting chemical and metallurgical engineer of the Industrial Bureau of the Industrial Club of that city and an authority on industrial location. We plan to have another story from him in the near future on the subject of shifting industries.

COMING FEATURES

CHEMICALS IN THE AVIATION INDUSTRY

Major Donald M. Liddell writes of chemicals and the airplane.

THE CHEMICAL LADY

Dr. G. J. Esselen, Jr., describes the part played by chemicals in clothing the well-dressed woman.

CHEMICALS AND RADIO

Austin C. Lescarboura, author of numerous articles on radio, and formerly managing editor of the Scientific American, tells of chemicals in the radio industry.